OLOGY DEPT.

Gas Journal

VOL. 277. 106TH YEAR. LONDON: FEBRUARY 3, 1954 NO. 4731. PRICE 1/3

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I hereby certify that Her Majesty's Commissioners
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for a Gas Meter
shown in the Exhibition
Exhibition
Hyde Park London. 15th Oct.r 1851
Albert
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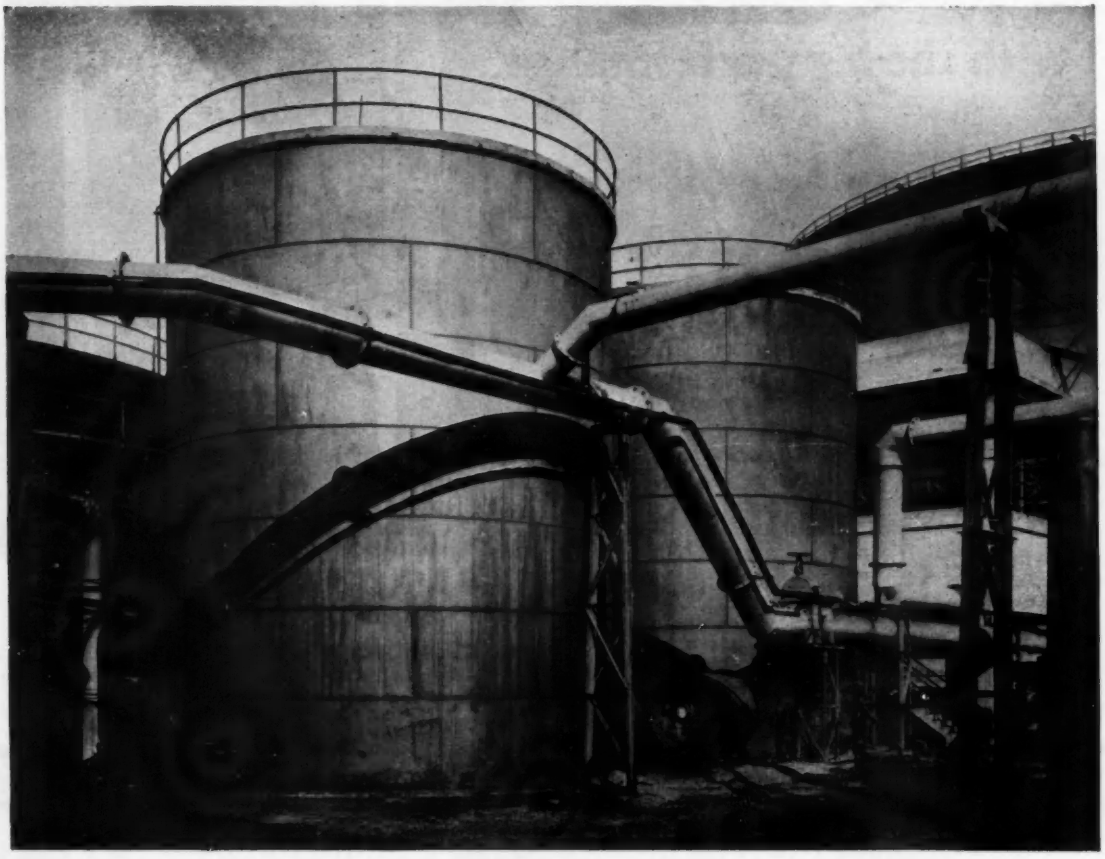

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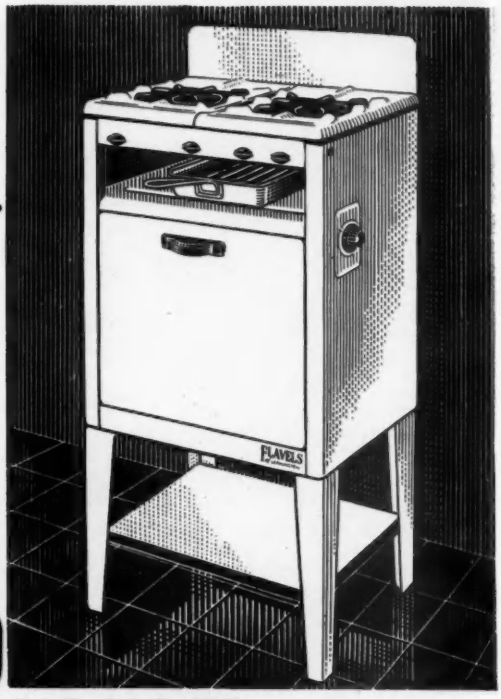

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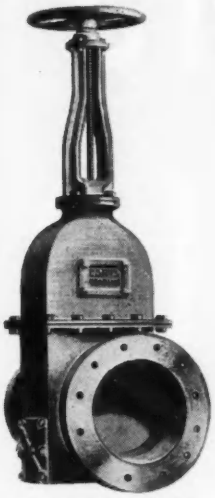

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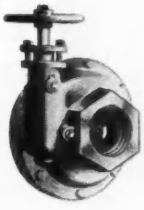

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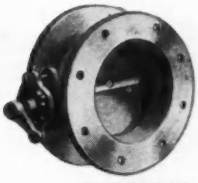

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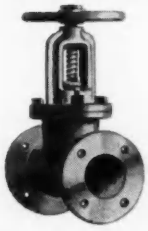

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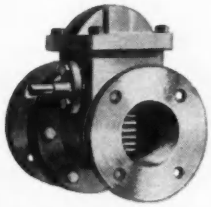

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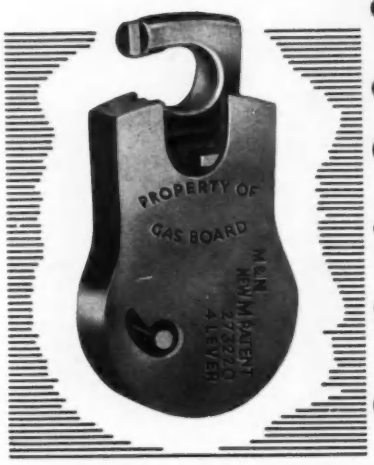

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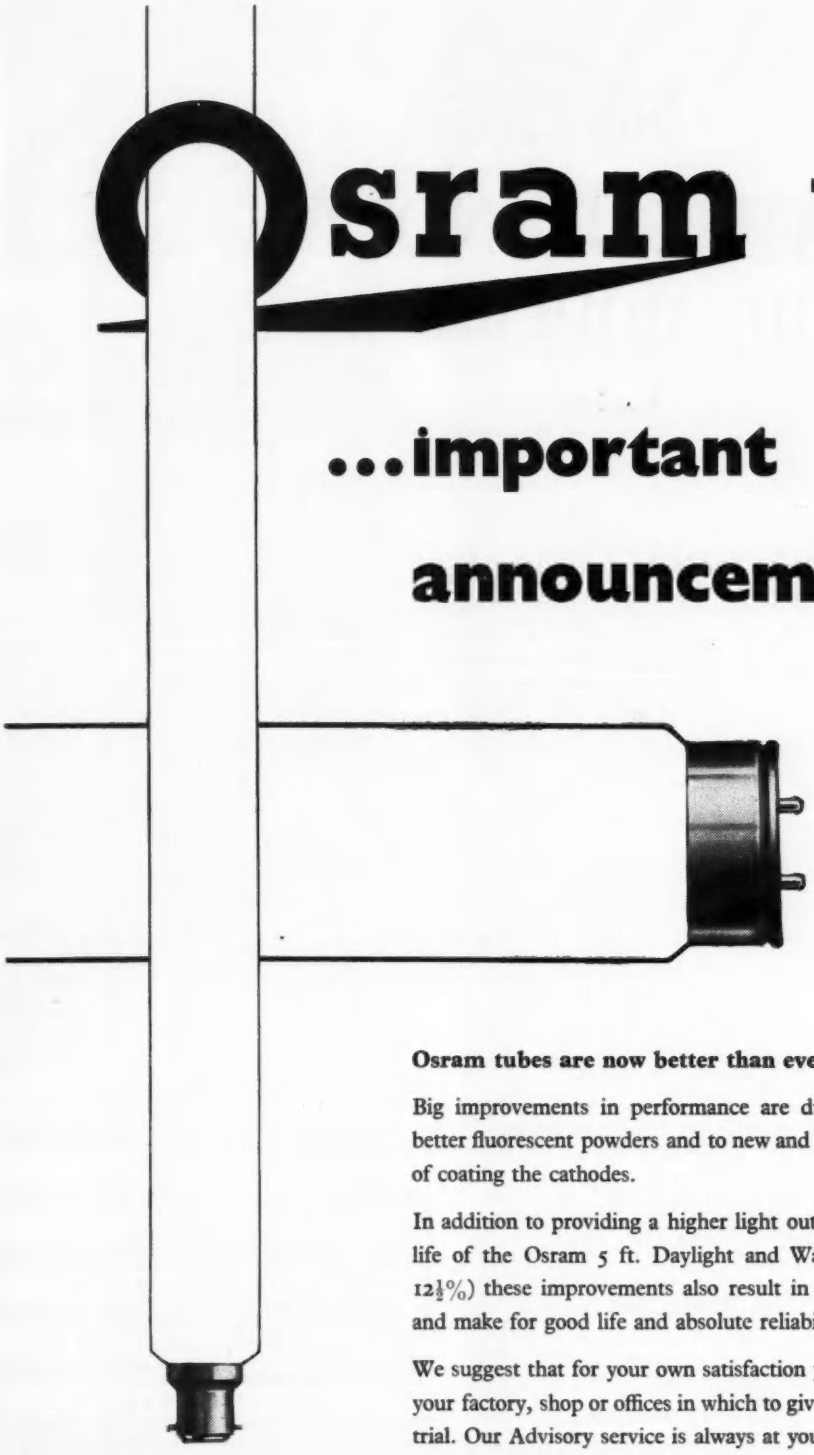

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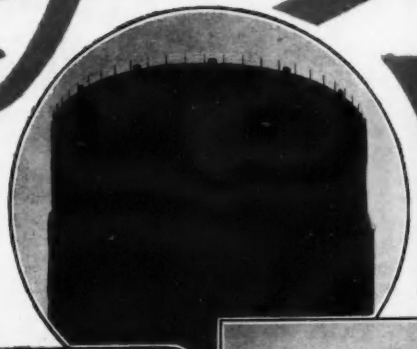

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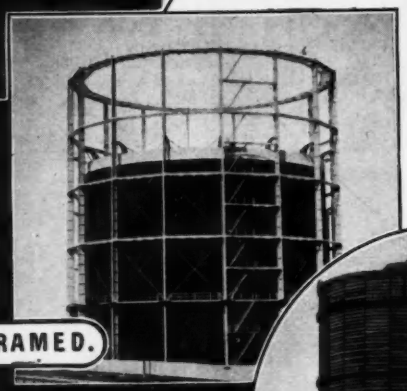

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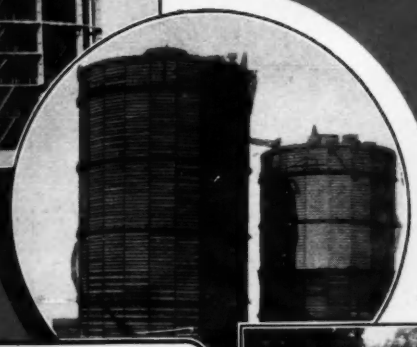

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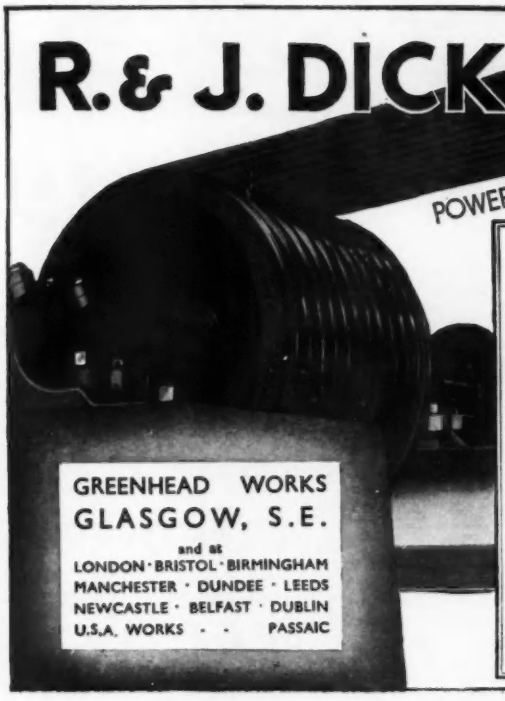

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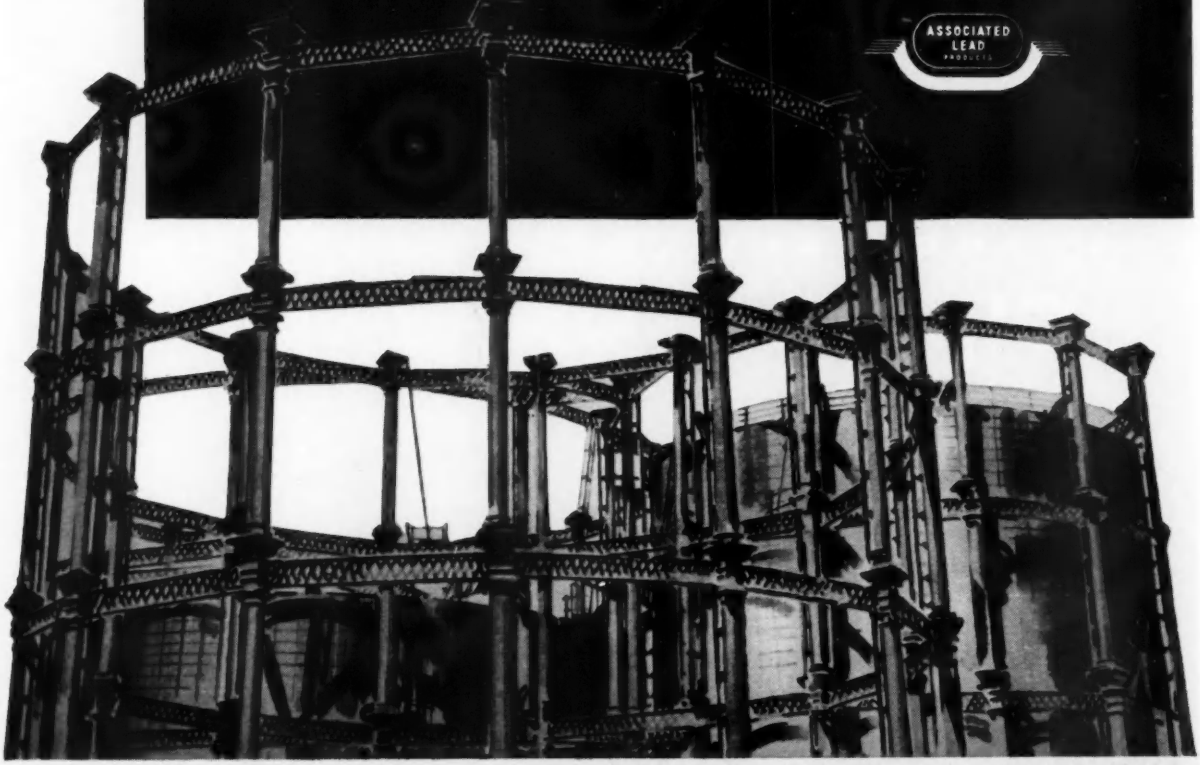

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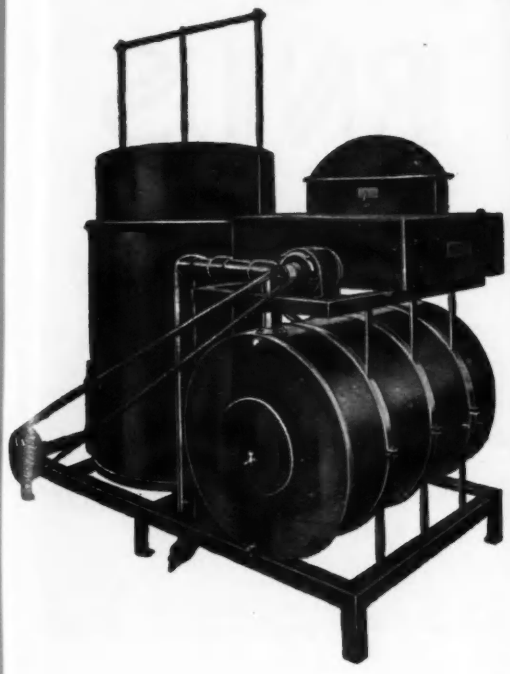

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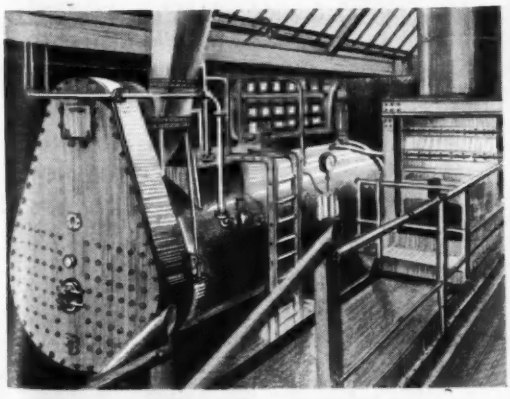

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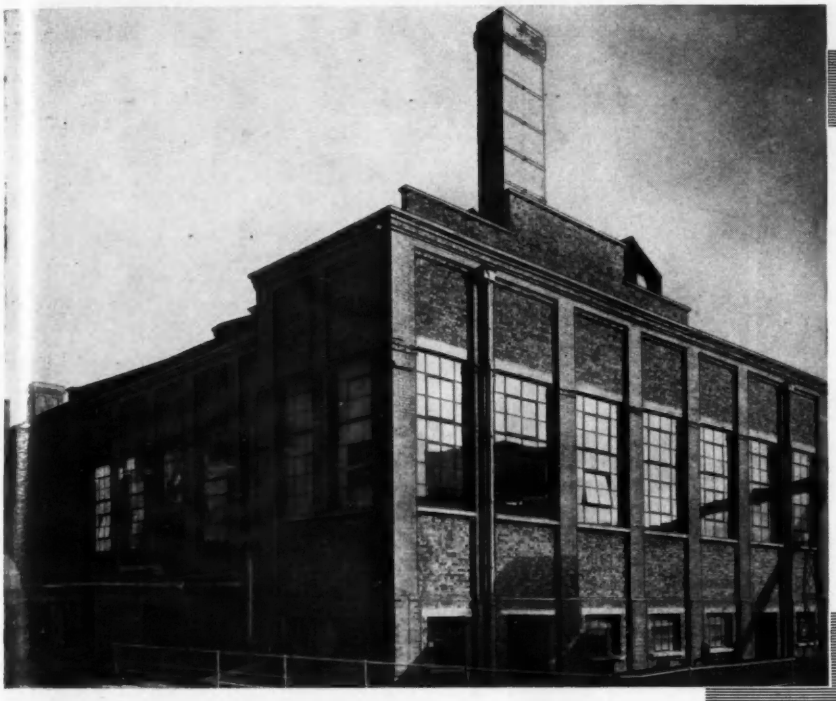

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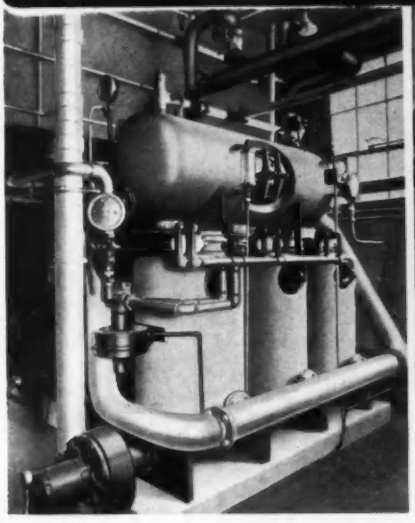

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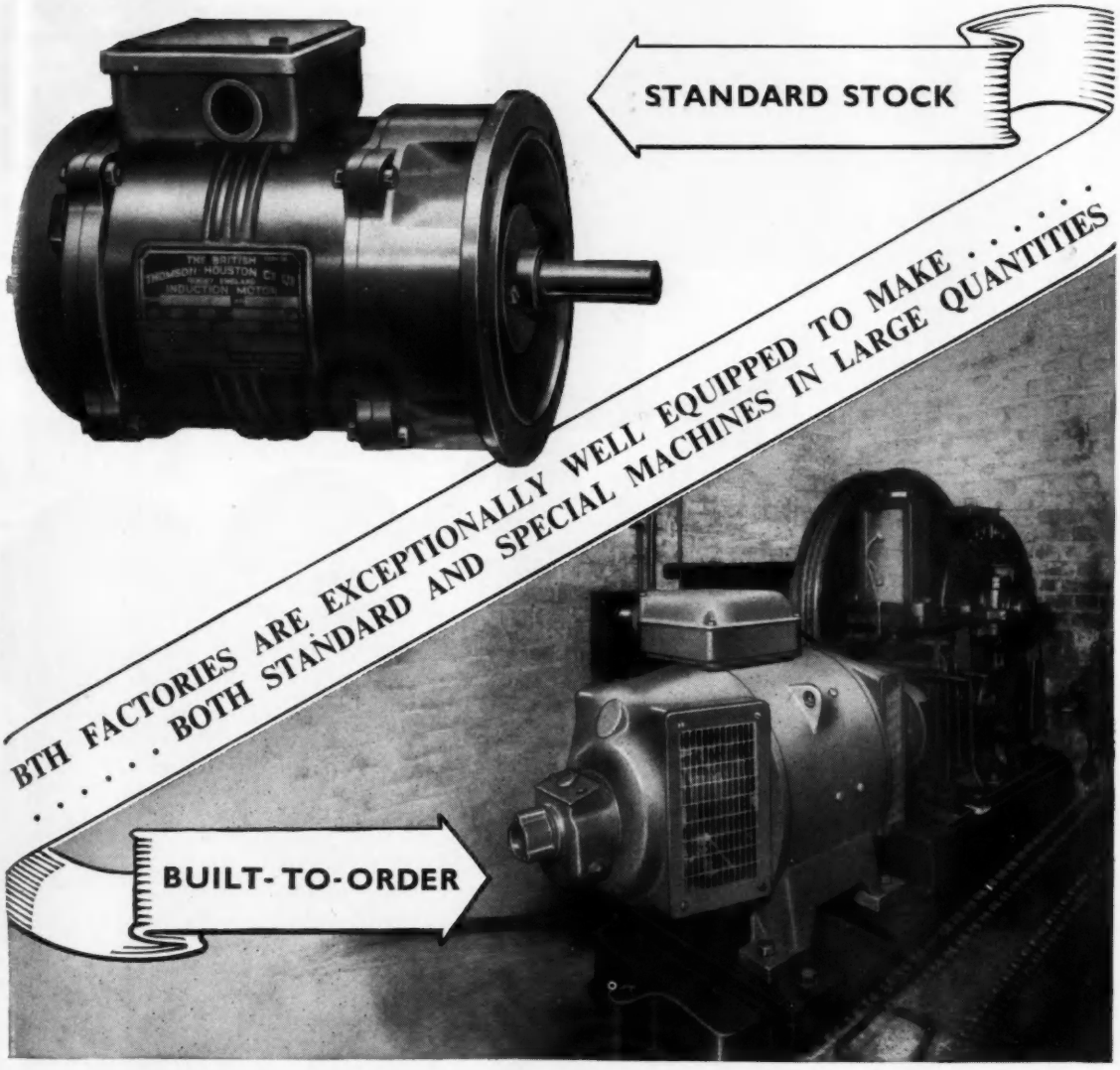
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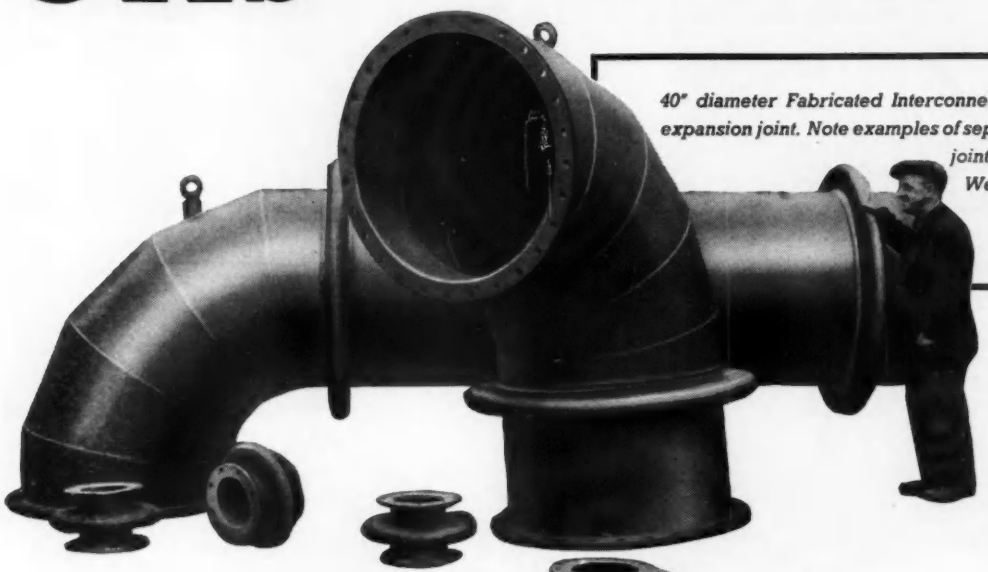

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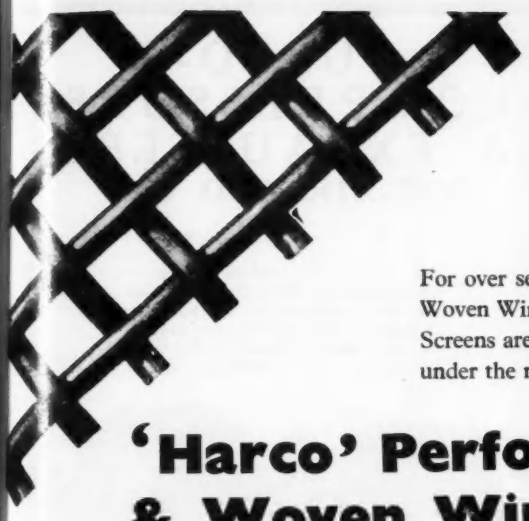

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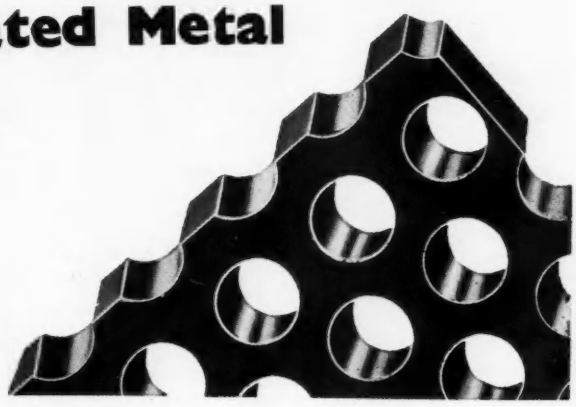

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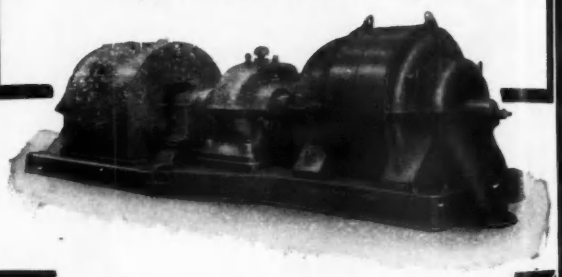

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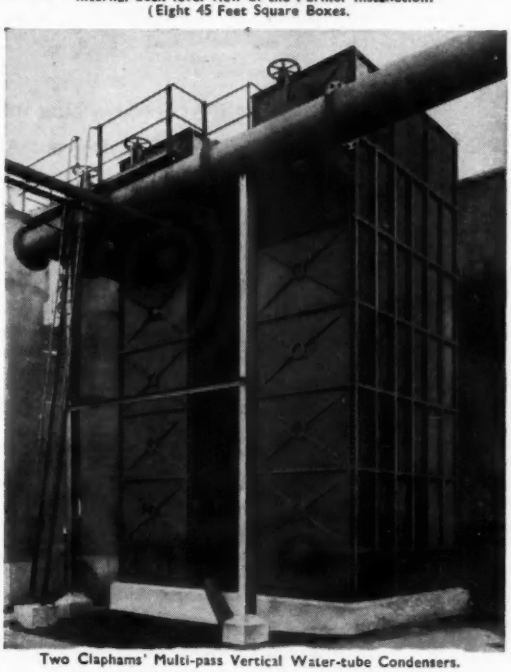

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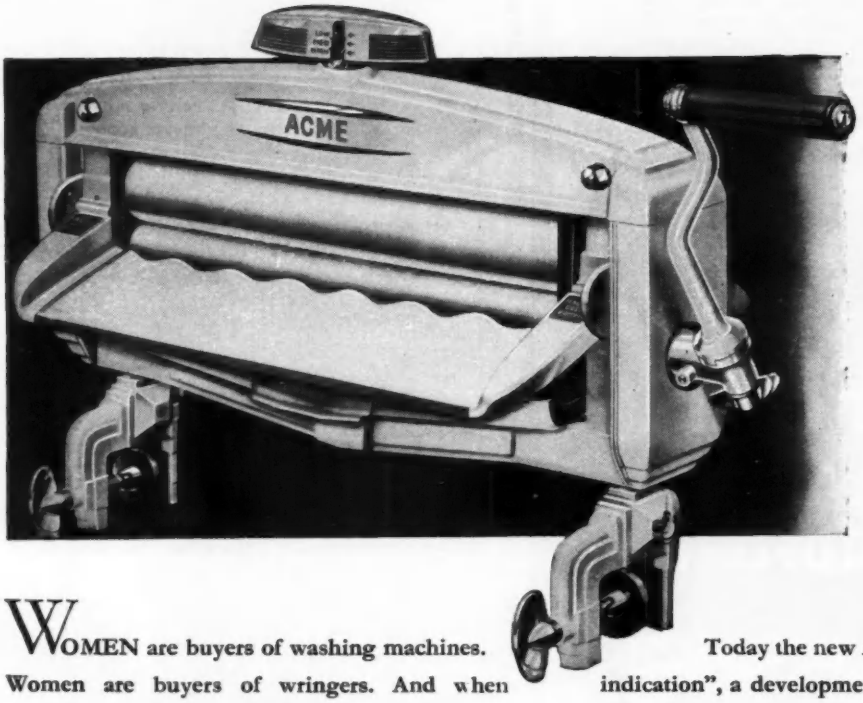

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106th YEAR OF PUBLICATION

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VOL. 277. NO. 4731 106TH YEAR February 3, 1954

FULL STEAM AT THE GASWORKS

The problem of the balance between power and steam requirements in the design and operation of the modern gasworks is a fascinating one. There appear to be two schools of thought, that which contemplates the self-sufficiency of the works and that which does not object to inter-connection with public electricity supply even to the point of export and import of current from the grid. We may distinguish a third school which contemplates purchase only from the grid as required to provide a make-up of power on peak load.

Mr. A. F. Grant's extremely interesting analysis of the position, present and future, at Bow Common, which he gave to the London and Southern Section of the Institution of Gas Engineers ('JOURNAL' of January 20), cannot of course be criticised in detail. One must keep, in comment, to general principles. One or two observations may, however, be made and questions asked even on points of detail. For instance, as an alternative to electrification of the carburetted water gas blowers, would it not be economical and convenient to increase the output of the waste heat boiler by some re-arrangement of run and blow so that the sets would be self-supporting in both steam and power? The continuous verticals at Bow Common are extremely efficient. Indeed 10% fuel consumption in this system is now commonplace. It may go lower. But, of course, this limits the supply of waste heat steam, and no-one would contemplate artificial augmentation beyond a very small amount.

Mr. Grant already contemplates that for the two benches of retorts there should be three waste heat boilers, one to each bench and one standby, a common feature in recent designs. This principle of three units is not so trivial as it may appear. With the power generation plant, for instance, in three equal or approximately equal units you can run any two on the day load and one on the night. The suggested use of tar burners in the Lancashire boilers, already analysed by Dr. J. Burns, is interesting. It is a pity that the small-mesh chain-grate stoker, so effective in the use of breeze, does not lend itself to running for long periods at low burning rates. In the problem of mixed internal and external supplies of electricity the suggestion to provide change-over switches on each outgoing panel of the switchboard for each alternative source of power is also of great interest.

Turning to general principles—and that means turning to the contribution of Mr. F. M. Birks to the discussion (last week's 'JOURNAL,' p. 233)—the national economy point of view is coal economy rather than the very lowest monetary cost, and that would seem to mean the maximum of power generation from waste heat and low grade by-products with export of surplus power to the electricity grid. 'It was highly desirable that the Board should be able to export any surplus electricity back to the grid.' There is the difficulty that the maximum amount, perhaps all, of this surplus is available when it is least valuable to the B.E.A. But surely it is in the country's interest that the price paid for it should be, while not more than what it is worth to them, at least as much as it is worth. If this could be satisfactorily arranged, and surely it is worth the attention of the Ministry, 'the whole situation would change and other details would just drop into their places.' One of the details, a big one, is the future of the impending developments in the combination of the waste heat (gas) turbine and the waste heat boiler.

Mr. Grant shows that, from the point of view of electricity supply, it is desirable to maintain the level of internal generation as high as possible. It may be that the heat input to the carbonising system may be still further reduced and absorbed in the system, but whether it will reach the point, suggested by Mr. F. Dawson, where 'in fact they had no waste heat steam at all,' may be doubted. No-one, however, would doubt the thesis that waste heat (*i.e.*, fuel consumption) should be reduced to the lowest possible level irrespective of what might be done with it. In the meantime the combination mentioned by Mr. Birks, with the whole of the steam passing through back-pressure turbines, appears to be the most efficient in sight.

In the discussion there was some feeling for other ways of disposing of surplus steam. Mr. Grant could not see much future either in the sale of steam as such (though in isolated cases it has been done) or in the use of the steam accumulator. Possibly the future, as indeed has been suggested by Dr. Burns, may produce such outlets for surplus power as the generation of oxygen and/or hydrogen for internal consumption. But for the moment the advantage would seem to lie in the further development of import and export of current from and to the grid and the solution of the electro-technological problems involved in change-over and parallel running.

BAKING HOURS

The Baking Industry (Hours of Work) Bill, the second reading of which was moved by the Minister of Labour, Sir Walter Monckton, last week has direct interest to the gas industry, for night-baking represents an off-peak load. The story goes back to 1848, the year before the 'GAS JOURNAL' saw the light of day, when a Bill was first produced in the House to prohibit night-baking. During and after the 1939-45 War renewed efforts were made to try to find an agreed basis for settling the question. In 1948, in Scotland, where the industry is highly organised, it was found possible to reach a voluntary agreement whereby night-baking was limited but not abolished. Today, not only in Scotland but in England and Wales, the unions concerned have made it clear that their objective remains total abolition of the night shift. In 1950 the then Minister of Labour appointed a committee—the Rees Committee—to go into the question anew. This Committee came to the conclusion—and the Bill is based largely on the Committee's findings—that total abolition of night-work would cause serious difficulties in the large plant bakeries in which three shifts are normally worked. It also concluded that abolition would cause a measure of inconvenience to the public, and would mean that some bakers would have to raise the price of their bread.

The main proposal of the Committee—and it is incorporated in the Bill—is that employers should be required to choose between two systems. Under the first system, employment between 10 p.m. and 5 a.m. would be totally prohibited. Under the second, night-work would be permissible, but no individual might be employed between 6 p.m. and 6 a.m. for more than half the weeks worked in any calendar year. During the debate Mr. Beverley Baxter spoke about newspaper-men working at night. Mr. Spearman (Scarborough and Whitby) suggested that this feat was accomplished so that the nation should not suffer from stale news. There is, of course, another point of view. Will stale bread prove acceptable to the nation's stomachs? It is for the baking industry to sort out its working hours and to abide by legislation. It seems to us that, the less the spreading of the baking load, the more expensive will become the cost of the loaf or its offspring in the form of 'tea-cakes,' buns, and 'confectionery' in general. And, going beyond that, the gas industry will, we think, be confronted with growing competition from oil. Gas can be stored for peak-load use; electricity does not hold this advantage. But oil can be stored for peak loads; and we suggest as a useful thermal exercise the picturing of the substitution of, say, a 1 mill. cu.ft. (500 B.Th.U.) gasholder for a tank of oil containing the same amount of potential thermal energy—on tap, and substantially free from sulphur, organic or otherwise. Merely a piece of paper and a pencil are needed for such an exercise, which will involve no night shift or the burning of any candle at both ends. But it will, in relation to the Bill, focus attention on competition and the need for the formulation of economic tariffs.

DEVELOPMENT OF INVENTIONS

Last week the President of the Board of Trade, Mr. G. E. P. Thorneycroft, moved in the House of Commons the second reading of the Development of Inventions Bill, which extends and slightly amends the Act of 1948, which established the National Research Development Corporation. The rôle allotted to the Corporation in 1948 was to hold the rights in certain inventions arising out of public research, and to secure the commercial development and exploitation of those inventions, plus any other inventions where it appeared the public interest so required. The House voted the Corporation £5 mill. over five years, though it has not spent anything like that sum. At the moment the Corporation holds some 500 patents at home and 227 overseas. The Corporation's purpose, Mr. Thorneycroft explained, is to promote and assist research. It is not primarily to undertake it, and never to undertake it in competition with industry or other Government departments. It is desirable, for example, that the work of the Corporation should not compete with the Department for Industrial and Scientific Research. For this reason the Bill provides that work has to be approved by the President of the Board of Trade and the Lord President of the Council.

NATURAL GAS

In view of the attention now being given to exploration for natural gas in Great Britain, an advertisement on p. 301 of this issue for a distribution and development engineer to handle natural gas in West Pakistan is of particular interest to young men of initiative and imagination.

VALVE PRODUCTIVITY

Since the war the valves industry has increased its sales abroad so rapidly that it is now one of our more important exporting industries with an annual output of over £26 mill. A review of productivity in the industry just published by the British Productivity Council says few if any trades have been able to do what the valves industry has done—multiply by more than five times the value of its output between 1946 and 1953. It is three years since the Valves Productivity Team visited the United States to study conditions in the industry there, and a report which followed the visit recommended that the industry should study the advantages of specialisation, standardisation, and simplification; that companies should organise material and production control systems to get materials, tools, and full information to the right place at the right time; that there should be more extensive mechanisation in the handling of valves and components; and that attention should be given to the more widespread use of power devices. The extent to which companies have re-organised their production methods and expanded their output, including several serving the gas industry, is described in an appendix to the review.

Some 200 companies in the United Kingdom manufacture valves, but well over three-quarters of the production comes from the 60 members of the British Valve Manufacturers' Association. Many companies in the industry are engaged in re-organisation which is likely to increase their efficiency still further. Some have streamlined their organisation and established production planning and control departments. Scrap has been reduced by using better machinery. One manufacturer has estimated that at one time 20% to 25% of the materials used in making small spindles for water meters ended in scrap largely because the machines at hand were not suitable for the job; the introduction of new ones has almost cut out the losses. Some companies have developed effective group bonus schemes (one having resulted in a 30% to 40% increase in foundry output); others have introduced suggestion schemes and one has been able to accept one suggestion in four. In at least one factory output has doubled with only a 10% increase in labour and 5% increase in the number of machines. The review as a whole is an inspiring story of what can be done in an atmosphere of goodwill.

Personal

MR. G. W. GIBSON, Managing Director of Fry's Metal Foundries, Ltd., has been presented by his fellow directors with a silver salver to mark the completion of 50 years with the organisation.

* * *

MR. V. J. GARNER, who was for a number of years Technical Sales Representative for the Midlands for the Chaseside Engineering Co., Ltd., has now joined F. E. Weatherill, Ltd., in a similar capacity.

* * *

MR. H. J. HADOW, of the Department of Scientific and Industrial Research, has been appointed Director of the United Kingdom Scientific Mission in the British Commonwealth Scientific Office in Washington. He will also be Attaché for scientific questions to the British Embassy. Mr. Hadow is expected to take up his appointment during March in succession to Dr. W. A. Macfarlane, who has been appointed General Manager of the National Industrial Fuel Efficiency Service.

* * *

DR. W. ANGUS MACFARLANE is to become General Manager of the recently formed National Industrial Fuel Efficiency Service in March. He is at present Director of the United Kingdom Scientific Mission in North America. As senior chemist of the L.M.S. Railway Dr. Macfarlane had to deal with the practical as well as the theoretical sides of fuel utilisation. He later joined the Ministry of Fuel and Power, in which he became the first Director of Fuel Efficiency. In Washington he has been responsible for keeping the civil departments of the British Government and the industrial research associations informed of progress in research and development in North America.

* * *

MR. OLIVER THOMAS, Manager of the Materials Handling Department of the Fraser & Chalmers Engineering Works of the G.E.C., has retired after nearly 52 years' unbroken service with the company. Mr. Thomas joined Fraser & Chalmers, Ltd., as the company was then known, in 1902, and after a period in the machine shops and other departments of the company, was appointed manager of the estimating department of the materials handling department. He early became associated with Mr. R. K. Stockwell, the European manager of Robins Inc. of the U.S.A., with whom Fraser & Chalmers had licence agreements to manufacture materials handling equipment to their design. Under Mr. Thomas' guidance the two companies pioneered the development of modern materials handling equipment. The long association between the Robins Company and Fraser & Chalmers was in no small measure due to the efforts of Mr. Thomas. MR. B. S. PELTON takes over the position relinquished by Mr. Thomas.

Obituary

MR. F. BLANCHFORD, Director of United Gas Industries, Ltd., since its incorporation in 1929, died on January 21.

MR. V. HUNTER, who died on January 25, had been employed for 50 years in the Belfast Corporation Gas Department. At his retirement four years ago he held the position of meter superintendent.

MR. EDMUND J. FOX, M.I.MECH.E., formerly Managing Director of the Stanton Ironworks Co., Ltd., and a leading figure in the iron and steel industry between the two wars, has died at the age of 80. He was at Stanton from 1917 until 1942, and it was under his guidance that the centrifugal casting process, which revolutionised pipe manufacture, was largely developed there. A donation which Mr. Fox gave in 1936 to the Institute of British Foundrymen to provide the annual award of the E. J. Fox Medal for outstanding work in the field of foundry metallurgy commemorated the success of this process. His establishment in 1921 of works committees at Stanton was a pioneering development in employee-employer relationships. Mr. Fox was also a pioneer employer of industrial nursing in heavy industry, particularly in the coal mines in Britain, and was a prominent member of the Order of St. John of Jerusalem.

Diary

Feb. 4.—LONDON JUNIORS: Visit to Telcon works.

Feb. 6.—SCOTTISH JUNIORS (EASTERN): 'Maintenance of Mechanical Plant.' G. A. Wood, Edinburgh.

Feb. 6.—YORKSHIRE JUNIORS: 'Accounting at Group Level,' K. L. Pickthall, Group Accountant, Huddersfield/Halifax Group, North Eastern Gas Board. At Harrogate.

Feb. 9.—WALES AND MON. JUNIORS: Short Papers by students J. R. Fisher, J. Sargent, D. Thomas and G. Griffiths, Swansea.

Feb. 9.—MIDLAND JUNIORS: 'Controls and their Application.' L. Bevan-Lewis, Sperryn & Co. Staff Mess Room, Council House, Birmingham, 6.30 p.m.

Feb. 11.—NORTH WALES JUNIORS: Visit to John Summers coke oven plant.

Feb. 12.—SCOTTISH JUNIORS (WESTERN): 'Water Gas,' W. F. Cummings, Tradeston.

Feb. 12.—LONDON JUNIORS: 'A District Manager's Impressions in a County Division,' E. J. Hoadley, South Eastern Gas Board, 178, Edgware Road, 6.30 p.m.

Feb. 12.—INSTITUTE OF FUEL: 'Aspects of a National Fuel Policy,' G. Nabarro, M.P. The University, Leeds, 6.30 p.m.

Feb. 16.—LONDON AND SOUTHERN SECTION, I.G.E.: 'The Preparation of Coal for the Gas Industry,' E. M. Myers, National Coal Board.

Feb. 17.—INSTITUTE OF FUEL: Joint Meeting with the Institute of Petroleum. 'Underground Gasification,' C. A. Masterman. Grosvenor Hotel, Chester. 7.30 p.m.

Feb. 18.—EASTERN SECTION, I.G.E.: 'Rehabilitation of the Mablethorpe Distribution System after the Floods.' J. W. Wilson, East Midlands Gas Board; 'The Construction of a Pre-stressed Concrete Gasholder Tank at Cromer.' E. Williams, Eastern Gas Board, 17, Grosvenor Crescent, London, S.W.1.

Feb. 20. — MANCHESTER JUNIORS: Annual Dinner, Lyme Hall, Disley, Cheshire.

Feb. 23.—INSTITUTE OF FUEL: 'Carbonisation of Blends of Coals to Produce Metallurgical Coke,' by H. Burdgett. Institution of Mechanical Engineers, Storey's Gate, London, S.W.1. 5.30 p.m.

Feb. 25.—NORTH THAMES G.C.C.: Westminster City Hall, Charing Cross Road, London, W.C.2.

Feb. 27.—MIDLAND JUNIORS: Annual Dinner at Dudley.

Feb. 27.—YORKSHIRE JUNIORS: Short Paper Day: 'Works,' R. Mason (Huddersfield); 'Industrial,' N. Walker (Elland); 'Distribution,' E. Birkett (York). At Doncaster.

March 2.—MIDLAND JUNIORS: 'Underground Gasification,' G. Hart.

Calendar & Directory

ALTERATIONS

THE following changes have been notified during the past month. To keep the information in the new 1954 edition of the GAS JOURNAL CALENDAR AND DIRECTORY up to date readers are invited to note these alterations (together with the appropriate adjustments relating thereto in the 'Personnel' section of the DIRECTORY (pp. 138-150).

Page 22.—SOUTH EASTERN GAS CONSULTATIVE COUNCIL: T/N changed to RELiance 3265.

Page 27.—EAST MIDLANDS GAS BOARD: Add E. Johnson, *Assistant Technical Officer;* W. Bestwick, *Organisation and Methods Officer.*

Pages 27 and 30.—LEICESTER AND NORTHANTS DIVISION: W. R. Smout, *Div. Accountant,* vice C. A. Brain.

Pages 27 and 32.—LINCOLNSHIRE DIVISION: C. A. Brain, *Div. Accountant,* vice W. R. Smout.

Page 53.—NORTH THAMES GAS BOARD: L. O. V. Hayward, formerly *Coal Officer,* now *Manager, Coal Department.*

Page 68.—CHESTER: G. Davison, *Station E.,* vice J. H. Noble, retired.

Page 78.—REDCAR: Delete H. P. Allison, *E. and M.,* deceased.

Page 112.—PEMBROKE: J. Lomax, *E. and M.,* vice D. W. Rees, removed.

Page 117.—WEST MIDLANDS GAS BOARD: H. Moys, formerly *Production Engineer,* now *Chief Engineer.*

Page 167.—HOBART: T. Watson, *G.M.* Make 183 mill.; consumers 6,695.

Battling with the Elements

A Record of First-class Planning and Organisation

LAST WEEK'S WEATHER was, to say the least, inclement. It affected all areas of the British Isles and, of course, every gas board. We have not had the opportunity of visiting all the gas boards to hear at first hand their experiences and the way in which they coped with a nightmarish peak demand. We look forward to information from the boards regarding this renewed onslaught of the cold. We have, however, spent quite a time in the control centre of the North Thames Gas Board, and our visit has proved very profitable.

It is opportune to recall the penetrative analysis of

Integration at its peak, and in a nutshell at Monck Street. This is the result of many years of planning, before and after nationalisation of the gas industry.

the effect of load variation on costs which formed the basis of a paper to the Institution just over a year ago by Dr. J. Burns, Chief Engineer of the N.T.G.B., and Mr. L. J. Clark, Deputy Station Engineer at Beckton. From that most important communication we draw attention to two diagrams—scatter charts of all the area gas boards showing the relationship between atmospheric temperature and gas consumption. These charts are most illuminating and indicate the differences in relative demand among the 12 boards. They show that, as far as peak load conditions are determined by the weather, the North Thames Gas Board has the most difficult problem. (The I.G.E. Communication referred to is No. 417, presented at the autumn research meeting, November, 1952.)

In the paper to which we have referred the authors posed the query: 'What is the lowest temperature for which plant provision should be made?' With provision down to 21°F., on the one hand, there will be plant to meet all requirements, but, coupled with this, there is the probability of plant standing idle for many years without ever being used, incurring maintenance and standby labour costs and maximum production costs per therm. The other extreme may be placed at 35°F., where there will be sufficient plant to meet full requirements of occasional very mild winters only, with the certainty of failure to meet full requirements on all other years. There is, however, a minimum of plant standing idle at all times, and production costs for peak-load gas will be at a minimum.

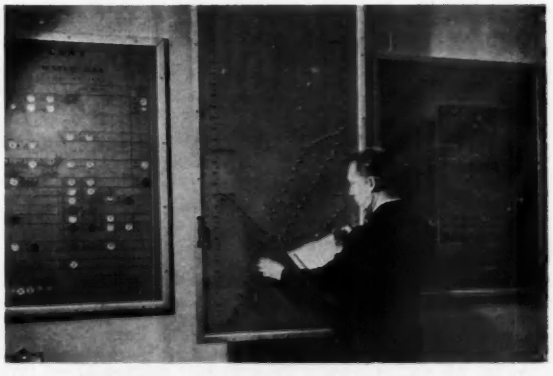
There is to this problem probably no single answer applicable to the whole country. It is up to each individual area gas board to find an answer suitable for its own particular set of conditions.

Under conditions obtaining in the North Thames Gas Board area the cost of producing a therm of peak-load gas may be as much as 13 to 14 times as high as the cost of producing a therm of base-load gas. Base-load gas still produces the cheapest therm and constitutes the most desirable load. But the amount of peak-load gas produced is small compared with base-load and sustained seasonal-load gas, and the effect of the high production and distribution costs is masked when spread over all the gas produced. Nevertheless, the effect of peak-load gas production and distribution is to raise overall cost of supply, and there is obviously a need for an adequate balance between base load, seasonal load, and peak load. In this regard the North Thames Gas Board has for years put in much concentrated work.

Cost is one aspect—and a highly important one. There is also the problem of providing, irrespective of weather conditions, first-class consumer service. This, of course, is the aim of every gas board. But it can be said that, on the 'outbreak' of nationalisation, the North Thames Gas Board occupied (as a result, by the way, of high ideals, constant diligence, and special circumstances) a unique and an enviable position. The former Gas Light and Coke Company did in fact in many physical respects constitute a board. It had gone a very long way in the matter of integration, and since 1949 the N.T.G.B. has gone a great deal further. Today the non-interlinked producing stations form a very minor proportion of the gas supply system. Apart from these few works, the vast area of supply of the Board is an entity planned for, and lending itself to, central control.

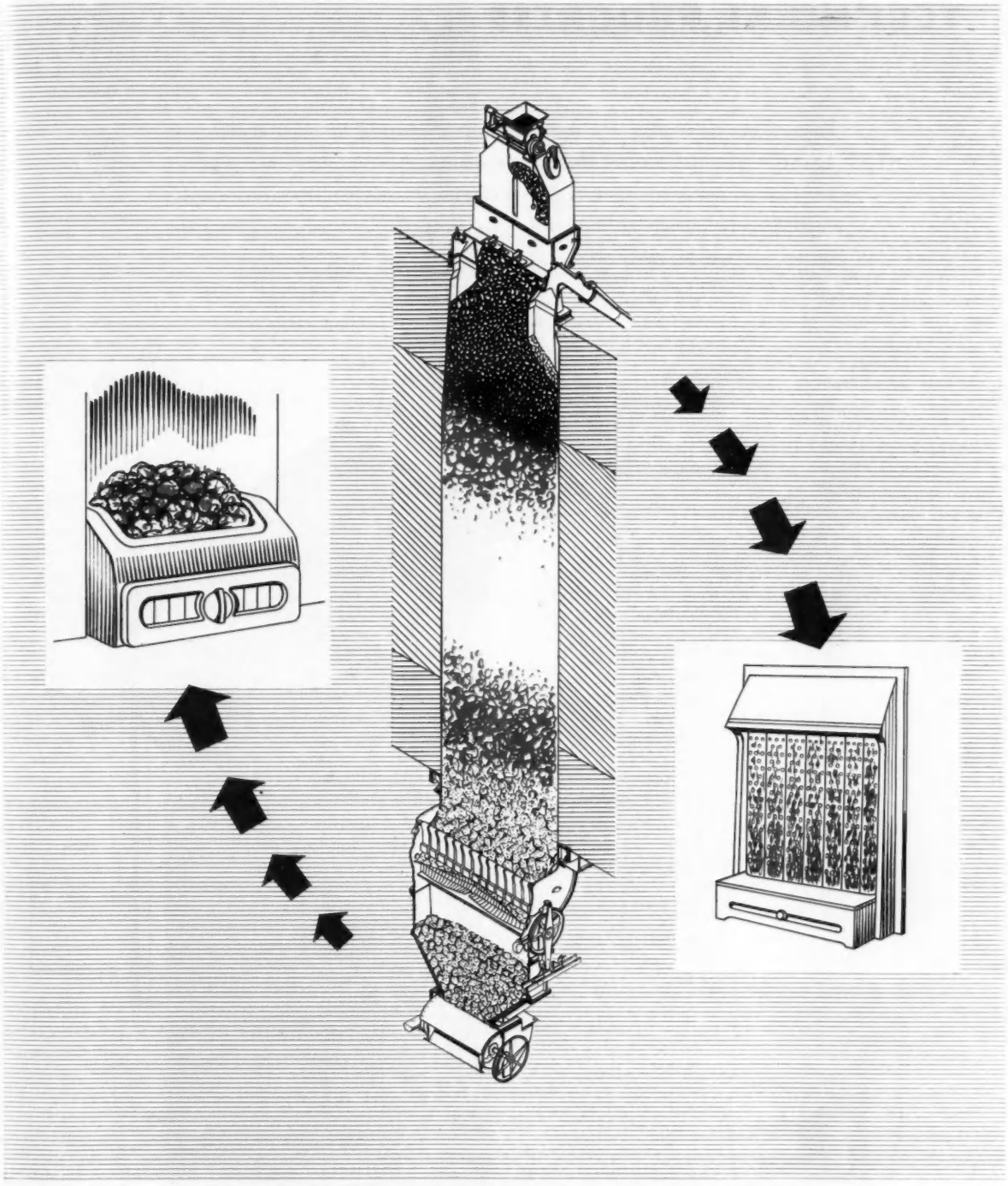
The nerve centre is at Monck Street, and on this page are two pictures of the control room. Its operation is simple and smooth because of the extremely efficient organisation behind it. The whole is a remarkable piece of co-ordination, the while allowing individuality and responsibility among those in charge of the various gas-making stations. The supply situation throughout the area can be seen at a glance in this control room, which owes nothing to superfluity.

Last week the Board was called upon to meet with a sudden and enormous gas demand; and it coped with the situation quite calmly and unflurried. Additional plant was quickly brought into operation. The smoothness of the change is directly attributable to the emphasis placed on the maintenance of all plant during every day of the year, sunshine or snow, calm or tempest.



'Three hundred and sixty-five days, all go to make a year.' On these charts the predetermined requirements of each day of the 365 are plotted. An object-lesson of foresight and simplicity.

On Wednesday last 357 mill. cu.ft. of gas was supplied by the Board. Installed rated capacity of the N.T.G.B. is 350 mill. a day. This, of course is a maximum figure. In fact, during January 27, 352 mill. cu.ft. was made and only 5 mill. from stock was needed to cope fully with demand. It is most interesting that the carburetted water gas plant installed recently by Humphreys & Glasgow, Ltd., rated at 18 mill. cu.ft. a day, actually produced 26 mill. cu.ft. Surely an example of flexibility. The meeting



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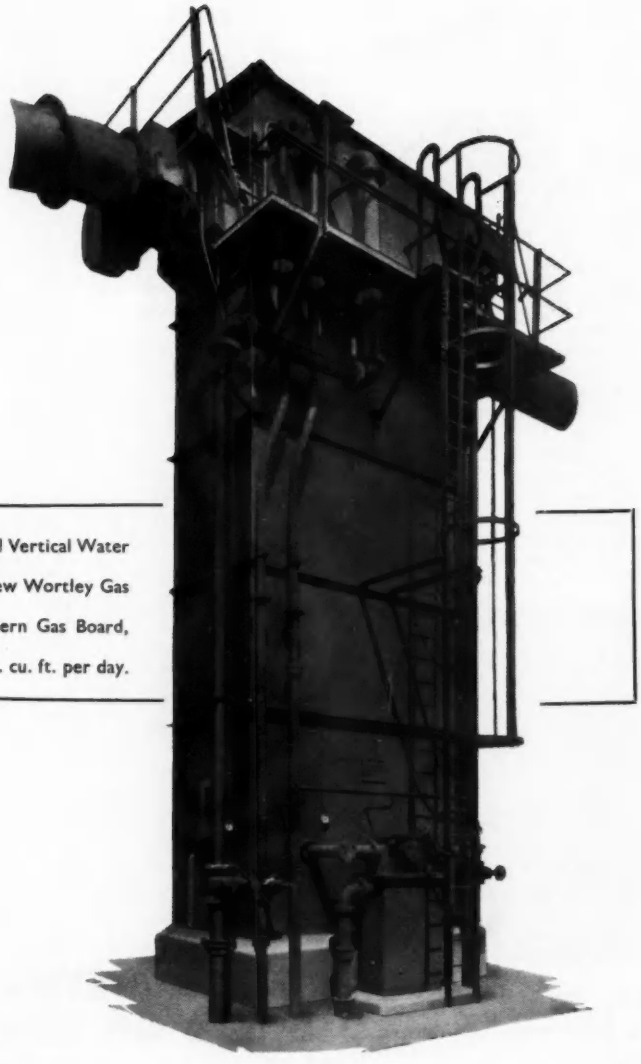

Illustrated is one of three Mild Steel Vertical Water Tube Condensers installed at New Wortley Gas Works, Leeds, for the North Eastern Gas Board, each having a capacity of 3 mill. cu. ft. per day.

DE
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f record loads of the type needs foresight and more an a modicum of imagination. And what we would ress is the fact that *at no time did pressures fall below* quirements *at consumers' premises.* We should not ve italicised the foregoing few words had we not held, almost a religious rite, that full gas service is needed the throes of winter. This brings in its train the vexed estion of the winter gas space-heating policy. But that not the purport of this article, major consideration of hich is to call attention to the forecasting of demand hich takes place in the control room of the N.T.G.B. Monck Street.

'Three days ahead' is a forecast regulation; and the hievement is at the consumers' burners. Twice a day, a tape machine, meteorological forecasts are recorded d action is taken on them. It is a matter of experienced ticipation. At control, the stock situation is hourly isible and guesswork is reduced to a minimum. An mirable result of practical planning with all concerned orking to a common end. And as we go to press we arn that the output on Monday, February 1, reached an ll-time record of 394 mill. cu.ft.

NATURAL GAS FOUND

NATURAL gas has been found at a depth of 4,800 ft. at Bird's Farm, Grosmont, Yorkshire, and a flame 30 ft. high is burning continuously at the head of the boring. The success of the search for natural gas was announced on Saturday from the offices of Imperial Chemical Industries, Ltd., at Wilton, near Middlesbrough. An official said that the discovery was encouraging, but it was too early to assess the prospect commercially. If the gas was in sufficient quantities, he added, it would be piped to the I.C.I. factories at Billingham and Wilton, about 30 miles away.

The borehole was drilled by I.C.I. as contractor to the D'Arcy Exploration Co., which holds a prospecting licence for the area under the terms of the Petroleum (Production) Act, 1934. Arrangements for using the gas have already been broadly agreed between these two companies and the Northern Gas Board. The plan is stated to be outside the scheme for the exploration of natural gas which the D'Arcy Exploration Co. is undertaking on behalf of the Gas Council.

Just before the second world war the D'Arcy Co. found natural gas in the Eskdale area at a borehole at Aislaby, and since 1948 I.C.I. has also carried out exploratory drilling in Eskdale in a search which, while primarily concerned with potash, did not overlook the possibilities of finding methane.

Information obtained from this work in the north Yorkshire moors led to the hope that sufficient natural gas existed to justify commercial development, and in October, 1952, boring began at Bird's Farm to test this possibility.

SALARIES OF GAS STAFFS

THE following statement was issued from Gas Industry House on Friday evening: 'At a recent meeting of the National Joint Council for Gas Staffs consideration was given to a claim from the staffs side for increase on all salaries and salary scales. Agreement was reached that graduated increases on existing nationally agreed salary scales for males, ranging from £10 per annum to £25 per annum, will operate in respect of work performed as from February 1, 1954. It was also agreed that 80% of these increases should apply to the existing salary scales for women as from the same date.'

The increase, which it is estimated will cost the gas industry £500,000 per annum, follows closely on the increase in the wages of adult male workers coming within the purview of the National Joint Industrial Council for the Gas Industry, announced in the 'JOURNAL' of January 6, which took effect from October 4, 1953, and which cost the industry £1,250,000 a year.

A statement from the headquarters of the East Midlands Gas Board on Saturday said the new salary increase would cost the Board £50,000 a year. Mr. Sydney Smith, Chairman of the Board, said: 'We propose to absorb this cost as we did the £100,000 cost of the recent wage increase. Although it will impose a further strain on our budget, we still look to increased efficiency and larger sales rather than price increases to solve the problem of higher costs.' Reductions in gas prices announced by the East Midlands Gas Board last December, together with wage and salary increases, will cost the Board, over £300,000 as against its 1952 surplus of £279,000.

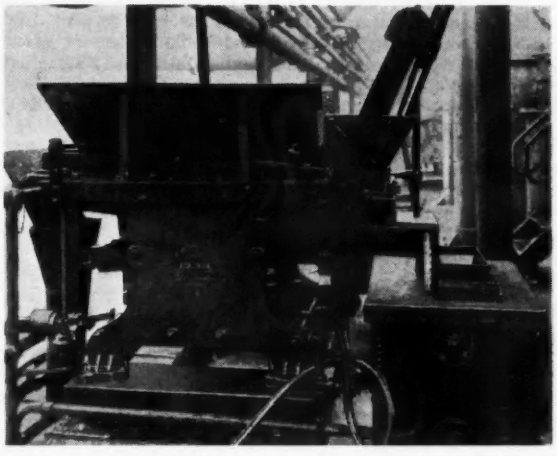
CLEANING COAL TAR

THE presence in coal tar of suspended particles of solids causes considerable difficulties in the tar handling system on the works. This is particularly the case on coke ovens. These solids settle out in tanks and separators, blanketing heating coils, thus preventing the proper heating of the tar necessary to ensure effective separation of the liquor. These deposits in tar tanks are very difficult to clean out and the operation is messy.

Many attempts have been made to separate these solids from the tar, but a filtration problem of this type is not easy. Considerable success, however, is attending a new design of filter produced by Russell Constructions, Ltd., chemical engineers, Russell House, Adam Street, W.C.2, and adapted for the special purpose of filtering coke oven tar at the Beckton gasworks of the North Thames Gas Board.

The filter consists of a stainless steel screening cloth which is vibrated at a high frequency but very small amplitude. Tar to be filtered pours on to this screen cloth held in an essentially horizontal position. The solid material is retained on the cloth and continuously brushed off into a receiving vessel at the end of the cloth. The filtered material passes into the tar collecting system.

Various sizes of cloth have been tried including 80, 100, 120, and 200 mesh. The effective throughput of tar was 1,000 gal. per hour up to the 120 mesh cloth, but above this the throughput was reduced. It is found that the 120 mesh cloth is suitable. With a normal coke oven tar the 120 mesh cloth removes approximately 1% of sludge, which slude contains approximately 20% of dry solid material.



The new design of filter in operation at the North Thames Gas Board's works at Beckton.

The most interesting operational characteristics of this filter are:—(1) There appears to be no signs whatever of the screen cloth 'binding.' (2) The tar feed can be interrupted for long periods, and provided a hot tar feed is restored the plant restarts work satisfactorily. (3) Intermittent feeds of hot liquor do not interfere with the passage of the tar through the screen.

Up to the present time approximately 500,000 gal. of tar have been filtered through the unit at Beckton at the rate of 1,000 gal. per hour, and operation has been satisfactory.

Further work with the filter will be directed to a study of the possibilities of reducing the water content of tar. It is known that many of the problems of separating water from tar are associated with the presence of solids in suspension, and it is expected that their removal will allow of easier separation of tar and water. As already indicated, the removal of solids will render effective the heating system in separators and improve separation. Further work is continuing on the possibilities of centrifuging the filtered tar in order to get down to the essentially complete removal of water from tar. This work is showing promise.

THE British Standards Institution has issued the first of a series of British Standards for copper alloy valves for general purposes. This is B.S.2060:1953. It is intended that this series will be followed by other series for ferrous valves for general engineering use. Copies of this Standard may be obtained from the British Standards Institution, Sales Branch, 2, Park Street, W.1. Price 4s.

TOWN GAS PRODUCTION

By A. F. COTTRELL and T. W. AUSTEN

(*Concluded from p. 232*)

Frequently vacuum cleaning plants are also installed to cut down the labour for cleaning. They consist of fans connected to pipelines with spring-loaded bayonet caps at various points. Flexible hoses and the appropriate cleaning tools are then connected to these points and cleaning proceeds by vacuum.

Where radiation from setting front walls and sight boxes is considerable, cold air douche plants can be provided to improve conditions while men are working at the various hot points.

Coke oven plants, of course, are never housed.

Instrumentation

This is a field in which there have been great developments to obtain best possible control for highest efficiency. Practically all modern plants are provided with numerous instruments mounted on centralised panels. There are various views on the advantages and disadvantages of this arrangement over the more general practice in earlier days of having individual gauges fitted at the particular piece of apparatus being controlled. It may be thought that there is too much centralisation of gauge boards, which enable plant supervisors to obtain the information they require without going near the particular piece of plant involved. Where an indicating gauge is actually attached to a piece of plant, readings can only be obtained by visits which enable the general conditions to be observed as well as the actual readings.

It is important for all gauges to be robust and of simple construction. They need proper attention if they are to be of any value; and this is particularly so where distant panels are used, because discrepancies are not so easily observed and incorrect recordings, etc., can therefore persist for long periods. Wherever there are a number of instruments, arrangements must be made for checking and servicing them. If this is neglected the whole scheme falls to the ground. It must be emphasised that instruments in themselves do not lead to increased efficiency of operation. It is the interpretation of the data collected that leads to efficiency, and there must be technical staff available who have time to study the results and who have the knowledge to judge whether the instruments are working satisfactorily or not.

Coke Screening Plants

In addition to the need for making the largest possible quantity of coke per ton it is also necessary to prepare it in such a way that it is acceptable to the consumers. Consequently a great deal of attention has been paid in recent times to the matter of coke screening. It is unusual today to find a gasworks of any size without a coke screening plant and possibly dry cleaning equipment to sort out the shale and bats. The layout of such plants and the conveyors thereto cannot be too carefully thought out as it is important to keep breakage down to a minimum and also to maintain constant and accurate sizing.

Table 3 sets out the approximate grading of coke which would probably be discharged from a carbonising plant using different coals and being steamed to varying calorific values.

The selection of the most suitable type of carbonising plant depends on a number of factors, the chief of which are: (1) Rank and size of coal; (2) calorific value of gas; (3) type of coke required; (4) ground space available; (5) local amenities; (6) flexibility of gas output; and (7) economics of production.

Tables 4 and 5 are put forward together with a short summary of plant characteristics as a useful guide in the matter.

Table 4 is reproduced from a paper by Finlayson and Townend (I.G.E. Comm. No. 334, 1948) and Table 5 from a paper by Richards (I.G.E. Comm. No. 181, 1938).

TABLE 3

Continuous Vertical Retorts

Coals	Yorks, Lancs, Midland and N. Wales			Durham, S. Wales and Somerset			Scottish		
C.V. B.Th.U.	500	475	450	500	475	450	475	450	425
0 in. — ¼ in. %	5	6	8	4	5	6	6	7	10
¼ in.— ½ in. %	10	11	12	8	9	10	12	13	15
½ in.—1¼ in. %	15	15	16	12	12	13	42	45	45
1¼ in.—2 in. %	35	35	35	30	30	30	20	20	20
Over 2 in. %	35	33	29	46	44	41	20	15	10

Intermittent Vertical Chambers

Coals	Yorkshire (500-550 B.Th.U.)	Durham (500-550 B.Th.U.)
0 in.— ¼ in. %	5	4
¼ in.— ½ in. %	10	8
½ in.—1¼ in. %	18	15
1¼ in.—2 in. %	27	20
Over 2 in. %	40	53

TABLE 4

Comparative Fuel Requirements of Four Systems of High-temperature Carbonisation

Type of plant	Non-recuperative Continuous Vertical Retorts (slight steaming)	Recuperative Horizontal Retorts	Recuperative Intermittent Vertical Chambers (slight steaming)	Regenerative Coke Ovens
Overall heating efficiency of carbonising system (%) (Heat utilised × 100) / (Heat in coke to producers)	43	60	62	64.5
Heat used (therms per ton of coal):				
Hot coke	6.0	10.9	10.7	11.3
Crude coal gas	3.5	6.4	6.4	6.1
Radiation, etc., loss	4.6	7.1	5.6	3.1
Steam reaction	—	—	1.0	—
Total heat used	14.1	24.4	23.7	20.5
Fuel to producers, allowing for heating efficiency of carbonising system (therms per ton of coal)	33	41	38	32
Less waste-heat steam recovered (therms per ton of coal)	10	5.5	5	—
Net fuel consumption, allowing for steam production (therms per ton of coal)	23	35.5	33	32
Less steam recoverable by dry cooling of coke (therms per ton of coal)	—	6.0	7.2	7.5
Overall net fuel consumption (allowing for waste-heat steam and dry-cooling of coke), therms per ton of coal	23	29.5	25.8	24.5

TABLE 5

Ground Space Occupied by Gas-making Plants

Type of Installation	Total output therms/day	Total sq. ft. ground space occupied	Therms/day/sq. ft. ground space
Inclined retorts	22,338	19,500	1.15
Horizontal retorts	34,560	23,400	1.48
Continuous vertical retorts	50,388	14,212	3.55
	46,670	13,300	3.50
	42,028	13,230	3.18
	31,200	11,520	2.71
	19,890	7,326	2.72
	5,724	2,580	2.22
	1,210	950	1.27
Intermittent vertical chambers	45,060	18,914	2.37
	34,040	14,432	2.36
	20,780	9,388	2.21
	1,920	1,830	1.05
Coke ovens	85,200	91,800	0.93
	84,500	62,200	1.35

Continuous verticals can be looked upon as the general utility plant. They can carbonise a very wide variety of coals and produce gas having calorific values

from 400 B.Th.U. upwards in Scotland and from 425 B.Th.U. to 540 B.Th.U. in England and Wales. They occupy relatively little ground space, have great flexibility as regards throughput and output, a very low fuel consumption, emit no noxious fumes, make a coke with a constant moisture content which is relatively easily ignitable, and, what is of particular importance today, the labour is less arduous and less unattractive than on any other plant.

Intermittent verticals give a somewhat higher thermal yield per ton at high calorific values than continuous, have considerable flexibility, are suitable for all sizes of works, but are slightly selective as regards the coal they can carbonise and discharge hot coke which has to be quenched, with resultant emission of steam and dirt. They occupy more ground space than continuous, fuel consumption is higher, and coke is denser. Gas of widely varying calorific values can be made by steaming, but this is deprecated on account of increased brickwork erosion.

Horizontals can carbonise a wide variety of coals and always make a high calorific value gas. Coke characteristics and fuel consumption are similar to intermittent vertical chambers, but gas output per unit of ground area is less. They have great flexibility but suffer from emission of dust and dirt from charging and discharging and steam from quenching.

Coke ovens should perhaps be considered only for large installations or for use in exceptional cases, and anything less than 600 to 1,000 tons of coal a day is not likely to be economic. They are somewhat selective as regards coals, always produce high calorific value gas, and have a relatively high net fuel consumption. Flexibility is limited, and therefore they should be looked upon as base load plants.

Availability of Slack Coals

The case for continuous vertical retorts is sometimes set aside by gas engineers in favour of intermittent vertical chambers or horizontals because they fear that the gas industry will in the future have to take increasing quantities of slack coal, which is rather more readily handled in such static forms of carbonising plant. From a study of available statistics on coal supplies and requirements the authors doubt if, in fact, there will be any increase in the quantity of slack coal available for the gas industry even if it wanted it.

The Ministry of Fuel and Power Statistical Digest, 1951, Table 64, shows that in 1951 the National Coal Board produced 66.2 mill. tons of deep mined slack coal, or approximately 35% of its total production.

It is interesting to see in Table 6 the disposal to various industries in 1951 of deep mined coal.

TABLE 6

		Total coal	Slacks	Graded
Electricity	mill. tons	32.3	27.7	2.4
Coke ovens	,, ,,	24.7	18.1	1.7
General industry	,, ,,	44.7	17.6	17.1
Gas industry	,, ,,	27.5	0.6	14.5

Obviously there was insufficient slack coal available at that time for the electricity and coking industries, and, in fact, they bought 4.1 mill. tons of graded coal, which is more expensive and less suitable. What therefore of future coal supplies?

Already there is a high degree of mechanisation in the mines, and it is understood that the Coal Board does not anticipate that slack and small coal production will increase to more than 37% or so of the total deep mined production. In the N.C.B. booklet 'Plan for Coal' an output of 240 mill. tons of deep-mined coal per annum is envisaged by 1965, from which it can be calculated that there will be 89 mill. tons of slack available for disposal.

The Ridley Report suggests that the future annual demands of certain industries will be as follows in 1961-65—

Electricity	63 mill. tons
Coke ovens	26 mill. tons
General industry (excluding gas)	56 mill. tons

Thus the electricity and coking industries will want the whole of this 89 mill. tons of slack. If general industry continues to require 17.6 mill. tons per year, as at present, it is obvious that these three industries will have to use more coal of other grades than at present, because there will not be 106 mill. tons of slacks available per year for them.

In addition the N.C.B. requires slack coals for its briquetting plants and it is not improbable that it will require increasing quantities if it cannot get a good price for this grade of coal but can do so for 'Phurnacite' and other types of manufactured ovoids. In these circumstances one cannot visualise the gas industry being asked to take more slacks. In fact the reverse seems likely to be the case, and the gas industry may have to take a bigger percentage of graded coal than at present.

It seems that the case for continuous verticals is a strong one; and, in view of the more reactive coke made by this type of plant, its sale to householders for the 4 mill. or so coke grates should not be difficult.

Water Gas and Coke Sales

Water gas is a very important feature of present-day gas-making practice, and installations are available on most medium and large works. It is in a different category from any other plant, as it is not a coal user and requires imported oil together with a fuel which has already been processed. Consequently its place in the scheme of things requires careful consideration.

Where horizontals and coke ovens are in use it is always necessary to provide a method of diluting the high quality gas to the standard required on the district, and for this purpose water gas is suitable. In addition it is a valuable method of dealing with snap or peak loads because of its flexibility, the ease with which additional units can be brought into operation, and because it is lower in capital cost than carbonising plant. It is as a base load plant, however, that controversies arise; and for various reasons it is doubtful if it should ever be used for producing base load gas.

Earlier in this paper it was stated that water gas is used to control the coke market, which practice seems to the authors to be fundamentally wrong from a national viewpoint. Why should base load gas be met from a water gas plant at 60 to 65% thermal efficiency when 80 to 85% thermal efficiency is obtainable from carbonising plant? As there is still a serious shortage of coal, every ounce of available coke should be sold both to industrial and domestic users to ameliorate the position. If it is used in water gas installations it is lost to this market and other solid fuel, usually in the form of coal, has to be found from somewhere else and be used at a very low efficiency.

In recent times there has been considerable argument about the cost of carburetted water gas as compared with coal gas for base load purposes. Apart from the price of oil it depends on the price of coal to the carbonising plant as against value of coke charged to the water gas plant. Various papers have been read on this matter, but as the economics in each case are based on prices ruling locally the findings are generally only applicable to that area. On the whole there is no evidence that a therm of carburetted water gas can be made more cheaply than a therm of coal gas even under best base load conditions.

In this connection it is pertinent to recall the words of Mr. G. E. Currier in his Presidential Address to the I.G.E. in 1953 when he pointed out that a coal shortage during the summer of 1953 would cause supplies to the gas industry to be cut to 1 mill. tons less than requirements with the result that the *additional cost* of producing the extra volume of carburetted water gas might well amount to £750,000.

The recent move towards smokeless zones and the many thousands of coke fires sold in recent years make it appear that the possibilities of selling coke for space heating have never been so favourable to the gas industry as at present. It is unfortunate, therefore, that the general public have not been and, in general, are not being educated to coke and prefer to use coal in coke grates which, more often than not, have been installed by the local gas board. An interesting exception has occurred in a suburb of Nottingham where 6,000 houses

are being erected with a condition of tenancy, specifying the use of smokeless fuel such as coke, anthracite, or one of the manufactured types.

The prejudice by tenants in favour of the coal fire has been overcome in the 1,700 houses already occupied by demonstration and advice given by officials specifically appointed to explain the advantages of smokeless fuels and the proper way of handling the appropriate appliances. What has been done in Nottingham can obviously be done elsewhere, and the authors feel that serious efforts should be made to educate the public to the value of coke. It is an old axiom that you can sell anything if you try hard enough or advertise well enough.

With the public buying 33,000,000 tons of domestic coal annually the potential market is not small one.

Smokeless Zones

The smokeless zone idea is growing rapidly and therefore the carbonising industries have a wonderful opportunity to expand their coke markets. Apart from any voluntary changing-over to such fuels there is always the possibility that the Government may be forced to take action both to safeguard the long-term coal position and to placate the clamour for a cleaner atmosphere. If and when this occurs the gas industry must be sure that it is in a position to meet all demands. At the same time it must see to it that all coke is properly prepared as befits a product that is such an important key to gas prices. It must be low in ash (a matter unfortunately not within the direct control of the gas industry), be properly sized, have a low and constant moisture content, and have, if possible, all shale removed. If it fulfils these conditions it should be readily saleable at a good price.

The following examples show that the space heating load of the country can never be met economically by gas or electricity, or, for that matter, by oil. It can only be dealt with satisfactorily by the use of solid fuel, which should be smokeless and mainly coke. With coke at £5 5s. per ton (4.5d. per therm) and an open fire at 40% efficiency the cost per therm of useful heat is 11¼d. With gas at 1s. per therm and a gas fire at 60% efficiency the cost per useful therm is 1s. 8d.; similarly with electricity at 1.25d. per unit and an electric fire at 100% efficiency the cost is 3s.

Surely, with facts such as these placed plainly and often before the public, coke cannot fail to sell.

A Two-Fuel Industry

The 1952-53 Gas Council Report indicates that coke sales in 1949-50 were 8.845 mill. tons, which increased by 17% to 10.325 mill. tons in 1952-53. In the same period gas sales increased by 15%. It seems wrong, therefore, to assume that increases in gas sales will result in a glut of unsaleable coke. We should consider ourselves, more than ever before, a two-fuel industry with coal carbonising plant of one kind or another the predominant manufacturing medium. Existing plants should be kept in good order and new plants must be erected to compensate for wastage and to meet potential new demands for coke as well as gas.

Fears have been expressed that the coking industry may soon be in the position of having more coke available for the domestic market, but this is a matter which must be put into its proper perspective. In 1951, when carbonising 23.5 mill. tons of coal, the coking industry disposed of 11.8 mill. tons of coke for blast furnaces and foundries and 4.2 mill. tons for other industrial and domestic uses. In its evidence to the Ridley Committee the coking industry stated that by 1961-65 its estimated coal requirements would be 26 mill. tons per year. If the present 'average' method of heating the ovens continues this will mean an increased coke output of 1.7 mill. tons to 17.7 mill. tons.

On the other hand the steel industry is planning to increase its steel output of 17 mill. tons in 1951 to 21 mill. tons, for which purpose it can be deduced that the coke required will increase to 14.6 mill. tons per year, leaving 3.1 mill. tons available for industrial and domestic consumers—*i.e.*, 1.1 mill. tons *less* than that at present available. It would seem, therefore, that the coking industry is likely to be less of a competitor in the future, unless, of course, steel demand fails to increase and the coking industry decides to keep its expanded capacity of 26 mill. tons of coal per year in full use.

In such circumstances there would be available 5.9 mill. tons of coke per year for industrial and domestic use, or 1.7 mill. tons more than at present. As stated, this presupposes a continuation of the present 'average' method of firing the ovens. If, however, additional rich gas is sold to the gas boards, then additional coke will be required to heat the ovens and will therefore not be available for sale.

Retort House Supervision

An important but incalculable factor as regards the cost of gas production is 'technical supervision.' The cost of retort house labour itself, despite wage increases, is not a very serious item in the final cost of gas, but indifferent or stinted technical supervision in the retort house does have a profound influence. The aphorism that 'profits are earned in the retort house' is only true if the retort house is worked efficiently; therefore retort house supervision must always be of the best.

In his Presidential Address to the Institution of Gas Engineers in May, 1953, Mr. Currier mentioned a thermal recovery of 80% to 85% from modern carbonising plants. This presupposes well-controlled operation, and if this is lacking nobody can forecast what the efficiency will be. It is useless for plant designers and contractors to install first-rate apparatus if the user fails to take advantage of its potentialities by neglecting such ordinary things as day-to-day maintenance, lubrication and cleaning, and does not provide adequate technical staff to look after other matters.

A technical supervisor on a works of only 250 mill. cu.ft. per year would be worth an additional £750 per annum if he could increase the gas yield by 1 therm per ton or increase the coke for sale by 0.2 cwt. per ton—*i.e.*, reduce the fuel consumption from, say, 15% to 14%.

It is very easy to lose one gaseous therm per ton through neglect of retort leakage, overpulling, leaky bottom ironwork with ingress of air and consequent combustion or poor carbonising temperatures with resulting high volatile therms in the coke discharged. Lack of attention to the producers can also result in serious inefficiency. Apart from heavy clinker formation and possible increased labour, the producer gas deteriorates as regards quality and temperature and the loss of carbon in the pan ash increases with consequent increase in the fuel consumption.

The effect on fuel consumption and efficiency caused by poor supervision can be shown by the following examples.

Producer Working

(1) If the calorific value is allowed to drop by 4 B.Th.U. per cu.ft., the fuel consumption will increase by 5%.

(2) If the temperature of the producer gas is allowed to fall by 100°C. the fuel consumption will increase by 5%.

(3) If the carbon content of the dry clinker increases from 25% to 40% the fuel consumption will increase by 3½%.

(4) An increase in fuel consumption of 5% (*e.g.*, from 15% to 15.75%) will increase the F.E.I. by one point—*i.e.*, from say 20 to 21.

Waste Gases

(1) If the waste gases leave the combustion chambers at 50°C. higher than normal the fuel consumption will increase by 5%.

(2) If the CO_2 content of the waste gases leaving the combustion chambers is allowed to fall from say 18% to 17%, through excessive secondary air admission, the fuel consumption will increase by 5%.

(3) If inadequate attention is paid to air infiltration in the waste gas flues and necks and the CO_2 is allowed to drop from say 15% to 13.5%, then the steam output from the waste heat boiler will decrease by 5%.

Fundamentally, of course, it is important to keep each installation as nearly as possible up to its rated capacity as maximum output makes for lowest costs all round and profoundly influences the F.E.I. It is appreciated that policy in this respect may well be dictated by many

considerations; but wherever the opportunity exists to work carbonising plants at or near 100% load factor, the costs of production will be reduced and the overall efficiency increased.

A keen retort house supervisor will appreciate this aspect of his job and see to it that he keeps a minimum number of retorts standing idle and hot, and he will also curtail scurfing time to a minimum. In addition to this he must give attention to steam leaks, to proper treatment of the boiler water, and must keep the boilers working at their rated steam pressure. In this latter connection, if a boiler rated at 120 lb. per sq. in. only works at 90 lb. per sq. in., although the steam output will increase by approximately 2% the steam pumps, etc., will require 13% more steam and result in a steam wastage of 11% on the prime movers.

There is no doubt in the authors' opinion that good retort house supervision always pays handsome dividends.

FUTURE TRENDS OF GAS MANUFACTURE

Despite the efficiency of modern traditional types of carbonising plants and their ability to treat widely-varying types and grades of coal, it is probable that some of the low-rank non-swelling varieties may be better dealt with by total gasification. If such proves to be the case there will be no coke for sale and the gas will therefore have to bear the whole cost of production. This means that the extra therms of gas will have to fetch at least as much as is normally available from coke. Unless this is achieved it would seem that the only result of this change will be to send up the price of gas unless there are other compensating factors.

Total gasification plants of the Lurgi type working at high pressures have been operated successfully on the Continent for many years with lignite, while the G.I. type has also been equally successful working at atmospheric pressures with low-rank coals. There seems no reason to suppose that such plants will not deal equally well with some of our own non-coking or feebly-swelling coals. Up to the present, however, neither type is in operation in Great Britain, and it would therefore be premature to enlarge upon their capabilities.

Oil gasification has also come into prominence in recent times due to the availability of increased quantities of heavy oils from the greatly expanded oil refinery plants. The Onia-Gegi system has been described by Robertson and Harrison to the Irish Gas Association and the S.E.G.B. system by Stanier and McKean in their I.G.E. paper (Comm. No. 375).

Butane and propane obtained from the refineries of the petroleum industry have already been used in small rural areas in place of coal gas and also as a means of meeting peak loads during repairs, etc. Methanisation —*i.e.*, the combination of CO and H_2 in blue water gas to form CH_4—seems to be a promising method of enriching to town gas standard if at any time there is a shortage of oil for carburetting.

Search is being conducted for natural gas, but it is much too early even to hazard a guess at the outcome.

In the meantime, however, a limited quantity of methane is being made available by the National Coal Board. Although the principle of draining methane from mines has long been known, it is only in the last few years, and then mainly on the Continent, that any great development of the process has taken place. Several collieries in this country are now piping the methane to the surface, and trials are under way at a number of others.

Blending of coal, while not being a process for gas manufacture, may become important in future practice. To conserve reserves of good coking coals the industry will almost certainly have to take increased percentages of feebly-swelling coals. While these coals, in graded form, can be dealt with in continuous verticals, as has been done for many years in Scotland, they will not produce a coke strong enough to withstand pushing in horizontals. It has been proved, however, that an appreciable proportion of these non-caking coals can be blended with coking coals to produce a strong coke in intermittent vertical chambers. The recently published work of the Fuel Research Board showed that under the same conditions of coal preparation and rate of coking the intermittent vertical chamber coke, although somewhat smaller than coke oven coke, had a shatter index equally good.

Précis of the Discussion

In presenting the paper the authors stated that they had been deliberately controversial in several respects in the hope of providing a lively and useful discussion. In this their aims were fulfilled. In fact, due to the lateness of the hour, the President (Mr. A. Cole) had to terminate the meeting and apologise to several members who had wished to put questions.

In opening the discussion, the President enquired as to the relative costs of intermittent vertical chambers and continuous vertical retorts, and asked why there seemed to be a tendency to swing towards the former type of plant.

The authors stated that, in general, the capital cost per therm was similar for both types of plant and, as regards the swing towards intermittent vertical chambers, they thought the gas industry was deluding itself in thinking it was going to get increased quantities of slack coals. Approximately 40% of the coal mined in Great Britain was not very suitable for intermittent vertical chambers.

In reply to a question about the maximum amount of steaming possible in intermittent vertical chambers, the authors thought it unwise to go below 500 B.Th.U. with most coals, as ash liberation during the steaming period tended to cause erosion of the bottom silica, which could only be avoided by lowering the temperatures and lengthening the carbonising cycle, with consequent reduction in gas output.

Asked about the possibilities of more dry quenching plants being installed with intermittent vertical chamber plants, the reply was given that it was unlikely that there would be much expansion along these lines. The disadvantages of dry quenching outweighed the advantages.

The question was raised as to the effect on therms per ton and H.E.V. of minor axis taper on continuous vertical retorts. The authors reminded the meeting of the paper by Burns and Weston, which showed there was an increase in this respect, but stated that their own personal experience to date was not sufficiently clear cut to confirm this. What was established was that continuous minor axis taper improved coal travel with strongly swelling coals, but with such coals it was difficult to steam below 520-530 B.Th.U.

Questioned about the advantages of supplying air to the producer by means of a blower and saturating it to a known temperature, the authors said that, as yet, there was no evidence to show that the fuel consumption was lower than with venturis. It did have the advantage of being able to use exhaust steam at a lower pressure than with venturis.

One member thought it rather absurd for the industry to produce more coke for sale if it could not sell the extra gas made. The authors pointed out that, to date, most people had feared that gas sales would increase at a higher rate than coke sales; and this was one of the reasons for considering complete gasification and oil gasification. If, due to political pressure, coke sales outstripped gas, then it was a relatively simple matter partially to heat the carbonising plant with the extra gas which could not be readily sold.

In reply to a question about the comparative life of intermittent vertical chambers and continuous vertical retorts, the authors stated that, as so many factors were involved, it was quite impossible to give a definite answer. They suggested that days of work should not be taken as the criterion, and that coal carbonised per 10 in. of major axis was a better method of comparison.

It was suggested that, with increasing electrification and steam economy on many works, the high steam output from waste heat boilers on continuous vertical retorts was sometimes an embarrassment, and the question was asked if there was likely to be a trend back to recuperative settings. The authors replied that only the gas industry itself could resolve that point, but they believed that, although the capital cost of a recuperative setting would be higher, the saving in fuel consumption might, in some cases, compensate for this. It must not be forgotten, however, that a recuperative setting would occupy more ground space.

In reply to a question regarding the possibilities of washing producer gas, lengthening the life of the plant, and reheating the producer gas in a recuperator cooling the waste gases to 300°C., the authors said that this had been done on the Continent, and that the gross fuel consumption was similar to

(*Concluded foot p. 286*)

GAS ACCOUNTS AND FINANCE

FROM A PAPER TO THE MIDLAND JUNIOR GAS ASSOCIATION, ON JANUARY 5, 1954, BY

R. L. SHAW,

B.Com., A.I.M.T.A., Divisional Accountant, Wolverhampton and District Division, West Midlands Gas Board.

I HAVE been much struck by the constant reiteration of the opinion that, under nationalisation, charges for gas should be made uniform, at any rate in the area of a gas board. Such levelling of charges was surely, it is claimed, one of the objects of nationalisation. Whether the protagonists of such a viewpoint contemplate the possibility of any increase of charges in certain areas, which would be inevitable, is probably doubtful. In these discussions the contrast is often drawn with electricity charges, where a common scale of charges throughout a board's area is more prevalent.

On the last review of gas tariffs, the Chairman of the West Midlands Gas Board, in his report to the Consultative Council, stated that the Board had given full consideration to this point of view. It had carefully examined the statutory provisions and official pronouncements and had been unable to find any support for the contention. The Board was fortified in its view by the recommendations of the Ridley Committee, which specifically commended the principle of relating charges to local costs.

While gas and electricity have many common economic characteristics affecting the basis of charges, there are strong reasons why gas charges should bear relation to local costs. To a much greater extent than electricity, gas manufacture is to a degree a localised function and can be economically carried over long distances only if the quantities are large enough. The size of the supply concerned and the characteristics of the area determine to some extent the question as to how far transmission is economical. Where there is a heavy demand spread over an industrial area or in the case of a bulk supply such as that obtained from coke ovens, there may be considerable scope for gas transmission and the concentration of production on large plants. A further factor affecting the localised characteristics of gas supply with its consequent effect on tariffs is, of course, the question of the coke market which is localised to a considerable extent by reason of its bulk and cost of transport.

While the above-mentioned considerations, will always apply, the tendency is for concentration of manufacturing plant to take place and for schemes of integration to be developed. These factors will inevitably mean a greater spread of capital charges and a consequent levelling of gas tariffs as time goes on.

Spread of Capital Costs

Under conditions of nationalisation it can arise that the recovery of capital charges through gas tariffs can be spread over a much wider area than that of the district where the capital expenditure is actually incurred, if a gas board takes the view that capital development should, wherever possible, be regarded as for the long-term benefit of the area as a whole. In other words capital charges can as a matter of policy be broadly regarded as payable by the Board out of its general income and not out of the income of the particular district. This method of treatment of capital charges has a levelling effect on tariffs and this effect will increase as the impact of capital charges continues to grow.

The economic characteristics of gas supply and pricing policy were, as in the case of electricity, very largely conditioned by the heavy weight of expenditure for fixed costs covering depreciation and interest charges on high capital outlay on plant and distribution systems, as well as the maintenance charges. There is the same diversity of consumers covering domestic, industrial, and commercial users for purposes of lighting, cooking, space and water heating, industrial power, and public lighting. In many of these fields gas and electricity are in competition with each other as well as with solid fuel and oil.

In fixing tariffs for all classes of consumer it is necessary to have regard to the principle of equity as between the various classes as well as to the promotional aspects of the tariffs. In the gas industry the block system of tariffs has come into use as a suitable means of carrying out these principles.

The block system provides a means of reflecting in the charges to consumers the costs of affording the supply, particularly if the system is supplemented by a further reduction or discount when the supply exceeds a certain minimum figure. The factors to be borne in mind are as follows:

(i) Fixed or standing charges. These cover such items as repairs and reading of meters and collection costs. They do not vary with the quantity of gas manufactured or consumed but vary with the number of consumers. All consumers should contribute, as nearly as possible, equally to these expenses, whatever their consumption.

(ii) Variable expenses, which vary with the volume of gas produced, such as coal and carbonising wages. Expenses under this heading originate as production commences and cease as production ceases, and every therm of gas sold should include these costs at a flat rate.

(iii) Intermediate class of expenses: This class covers for manufacture, maintenance of works and buildings. Such costs remain fairly constant whether the plant is working to capacity or not. It covers, for distribution, repair and maintenace of gasholders, mains, etc. These items do not vary with the amount of gas distributed but depend on size or capacity of the distribution system.

The class of expense varies broadly with maximum demand and reduces in terms of cost per therm as consumption increases. In order to ensure that this class of expense was recovered as precisely as practicable as between consumers with varying volumes of consumption, the West Midlands Board, in its last review of tariffs, increased the number of blocks to nine, with appropriate price reduction calculated to produce as nearly as possible a fair contribution to standing charges.

For large industrial users with favourable load factors it is not uncommon to find that boards are prepared to enter into special agreements with such consumers under which further discounts are allowed from the normal tariffs.

There is, as we know, a strong tendency for gas and electricity to compete for new business. The meeting of the country's needs for power economically, is a difficult problem and much enquiry has been devoted to it. Strong arguments have been advanced that to permit

(*Concluded from p. 285*)

that of a normal recuperative setting heating secondary air only, and, on a net basis, was higher, because there was no waste heat steam. They doubted whether washed producer gas would necessarily increase the life of the plant, because the necessity for repairs usually arose from conditions on the coal face of the retort or chamber rather than the combustion chamber side.

Questioned about the economics of heating a setting with coal instead of coke, the authors said this change would depend on availability and price of feebly-swelling coals and the capital cost of suitable producers.

There was much discussion in the body of the hall between members engaged in selling and production regarding the possibility of increasing coke sales. The general consensus of opinion seemed to be that, provided coke was properly prepared (free from bats, etc.), and the public educated to its advantages, there was a great opportunity of increasing sales, particularly in view of the present move towards smokeless zones. It was thought that there was a large untapped market to be gained in the many new housing estates springing up throughout the country.

ee and untrammelled competition between gas and electricity is not in the national interest. Immense capital being sunk into the electricity industry, and it is claimed that a waste of national resources is being sustained if electricity is in fact being diverted from industrial power needs, where its use is vital, to the fields of domestic and commercial cooking, and space heating, which are more suitably served by gas by reason of its higher thermal efficiency. It is argued that this factor of higher thermal efficiency would prevent electricity from competing with gas in three classes of supply if it charged prices nearer to true costs of production and if, as it is claimed, these supplies were not being subsidised by the industrial and commercial consumers.

I read in a recent newspaper article by a Professor of Electrical Engineering—

'The Ridley Report virtually states that the domestic electricity tariff is compiled on an off-peak basis—that is to say, the capital costs, which are inevitably prodigious, have been mainly recovered from other users. It is principally this factor that enables electricity to compete in price with gas and not their thermal efficiency value. Gas can never recover overhead costs from industrial power users.'

This matter is one of great controversy, and nothing but good can come from discussion of the issues involved. In spite of all the opportunities afforded by nationalisation, little progress seems to have yet been made in the proper co-ordination of the country's fuel resources. I have introduced the matter in this context because of the likelihood that tariffs will be one of the instruments by which regulation could be achieved.

Epitome of Financial Statistics

The West Midlands Gas Board issues each year, for the confidential information of district managers, an epitome of financial statistics, prepared by the Chief Accountant. This shows for every district of the Board's area:—

(1) Summarised statement of income and expenditure (sterling).

(2) Summarised statement of income and expenditure (cost per therm).

(3) Income from sale of gas per therm sold and therms sold—for each class of consumer.

(4) Net cost of gas produced and purchased per therm made.

(5) Cost of general charges, manufacture, per therm made.

(6) Cost of distribution and consumer service, per therm sold and per consumer.

(7) Cost of administration and employees' welfare per therm sold.

(8) By-products—quantities produced and gross income.

(9) Net income from by-products, and gross and net costs of coal.

(10) Sales and hire purchase of appliances, number of transactions, income from sales, expenditure and net income.

(11) Amounts of fixed assets, pre-vesting and post-vesting.

(12) Other balance sheet items, including hire purchase amounts owing and stocks on hand.

Details relating to all ten districts in my Division are circulated confidentially to all district managers, and great interest is shown in the figures. The Divisional General Manager conducts a searching enquiry with his district managers, with a view to ascertaining the reasons for revealed differences in costs between districts.

District managers take great interest in the figures given for gross surplus. The sort of question raised is: 'If we have made all these profits why cannot prices be reduced in this district?' It should not be overlooked that the figure shown as gross surplus does not include capital charges (depreciation and interest), taxation, and contributions to reserves. District tariffs are carefully fixed by the Board to take account of these items. The object of issuing these comparative figures is to focus attention on comparative costs.

Informative as the epitome of financial statistics undoubtedly is, it supplies unit cost figures relating to a complete financial year, some time after the end of the year. An essential supplement to this information is a working statement giving more detailed costs at more frequent intervals. With this end in view a quarterly cost of gas into holder statement is prepared for every district of the West Midlands Gas Board, the main purpose of which is to provide management at all levels with information which will assist them in the economical and efficient management of the Board's undertakings.

These quarterly statements of manufacturing costs will be added to at a later stage by similar statements covering distribution and consumer service and also administration and other expenses. Quarterly summaries of income are already prepared, and when the three costing statements are available, the form will be combined to give summarised quarterly revenue accounts for each district.

The Board's annual revenue budget will be prepared on a quarterly basis, in detail corresponding with that of the quarterly costing statements, so that a comparison of the actual expense with the estimate will be available each quarter.

The cost into holder statements are regarded as supplementary to the existing production statistics produced daily or weekly for the use of management.

The costing described above is known as historical costing. Valuable as this is, it is undoubtedly subject to limitations. It enables fluctuations in costs between periods to be shown but it does not distinguish between these factors which are outside the control of management, such as wages, rates or prices of materials, as distinct from those for which management could be held responsible such as carbonising efficiency. An increase in costs per therm may be due to a fall in output. The present trend in costing technique is for a standard, estimate, or target to be fixed, and for actual performance to be measured against the standard, promptly and at short intervals, so that remedial action can be taken at the right time.

Budgetary Control

Consequently an accounting technique has been developed known as standard costing and budgetary control. Under this system the procedure is on the following lines:—

(i) Output is budgeted for, taking into account the available plant capacity and the anticipated rate of output.

(ii) Expenses considered necessary to obtain this output are budgeted, the expenses being divided into fixed and variable expenses. Based on these expenses, a standard unit cost per therm is calculated.

(iii) For the period under review, a statement would be produced showing, say, for gas manufacture, for actual therms produced:

(a) the standard cost;

(b) the allowed cost which takes into account the coal and other materials used at standard rates per therm;

(c) the actual cost for the period and the differences between that and the standard cost—known as variances.

(iv) The statement then analyses the variances over the following headings:—

(a) Those outside the control of management due to seasonal variations or increased prices of labour or materials.

(b) Those controllable by management, such as material usage or operating efficiency.

There is no doubt that budgetary control and standard costing on these lines is an effective instrument in the assistance of management. It seeks to provide the answers to many problems which a simple comparison of unit costs will not solve.

For example, if gas output is reduced because of a mild spell of weather, coal costs should be correspondingly reduced. How far does the reduction fall short of that expected? How far is any deficiency due to an increase in the price of coal, a reduction in coke yields, or a falling-off in efficiency in operation? Standard costing sets out to isolate the reasons and pin-point the causes.

Standard costing and budgetary control in the way described is somewhat complicated and is by no means universally adopted by gas boards. Future progress may

Concluded on p. 292.

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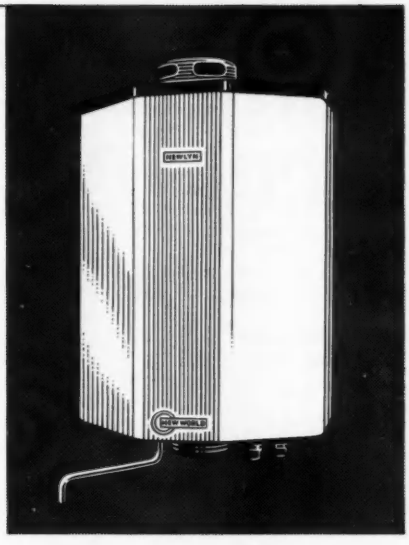

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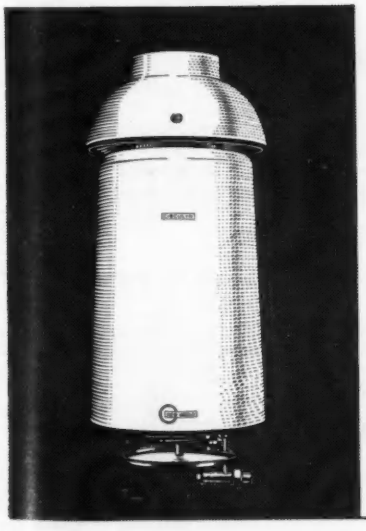

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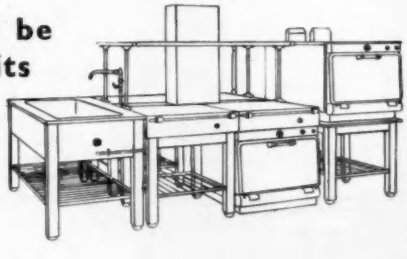

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Abstracts of Short Papers for the F. Johnston Prize

HOT GAS MECHANICAL PRODUCERS

By K. MORRIS-ASHTON, Carbonising Assistant,
Salford Undertaking, North Western Gas Board.

MECHANICAL producers have received adequate attention in several papers during the last few years, and in most cases, except where the correct type of labour for operating step-grate producers is unobtainable, they have been found to be more costly and, to some extent, not as reliable. Recent improvements in design giving greater gasification rates and smaller maintenance costs than formerly, also more reliable assured output over a long period, have, I feel, altered the position considerably.

The design of the central arch in the hot gas type of producer also gives the same sensible heat as many types of step-grate, and the producer is mainly suited for supplying hot gas to retort settings.

The working knowledge has indicated that, considering the West's hot gas producer was a small-diameter unit, results were very good. It seems to be the orthodox view that producers of less than 10 ft. 6 in. diameter are not a paying proposition. At Salford, however, five West's producers of 6 ft. 3 in. diameter have been installed. The two settings which are at the moment working would require one 10 ft. 6 in. producer on full load. This would mean, however, that any trouble with this producer would affect the complete house, and therefore a standby would be required. Two West's producers are needed to supply the same two settings, but still only one standby is required, and the plant is more flexible. Saving in capital cost is considerable.

At Salford, the new retort house contains two benches each of 24 50-in. retorts, and a third bench is under construction. To heat these benches, five West's mechanical hot gas producers have been supplied. One producer will supply enough gas for one bench, the fourth one being for waste gas augmentation purposes, and a fifth for standby. The producers are run on full load because best results are obtained at a high blast rate with a deep ash bed and a fairly narrow reaction zone.

On one series of tests on these producers, screened breeze was used as the fuel but was not a success, excessive channelling and clinkering occurring, even at very low gasification rates. Considerable run-through of fuel almost prevented maintenance of an ash bed. Damage to the arch and grate lips was also excessive. However, due to fluctuation in the coke sales, the coke used has to be varied, and different grades of fuel were used during the tests tabulated in this paper. A mixture of coke and screened breeze can also be employed, the limiting percentage of breeze on high loads being 30%. Dust is a problem at high gasification rates.

In addition to the tests tabulated investigation was made into the effect of different depths of ash bed, and the resultant depths of reaction zone at different blast rates.

The producer is supported on a blast chamber in which the extractor-type helical grate is supported on rollers and is slowly revolved by a Lockheed hydraulic control unit which can be operated at variable speeds. The lower portion of the producer is water-jacketed and around this is an air jacket for preheating the blast. The producer is firebrick lined above the water jacket, and the gas offtake is incorporated in a central arch. Thereby producer gas to the settings is removed from the reaction zone. Ashes fall into a receiving hopper below the producer which forms an extension of the blast chamber.

The dust extractor consists of a series of vertical firebrick baffles, the dust outlet being water sealed. Coke is charged every two hours by a travelling skip after being weighed on an Avery machine. Ash dips are taken every two hours, a record being made of the reaction zones and ash depth. Certain mechanical alterations have been made.

Collective results are given in Table 1. The first test was carried out on a low load, but the producer output had to be doubled for the next test owing to an increase in steam requirements necessitating augmentation. The third, fourth, and fifth tests were carried out on a similar fuel and increasing gasification rates. Test No. 6 was carried out using for the most part domestic coke. For the seventh test a mixture of medium sized coke and screened breeze was used.

On maximum load, using domestic coke mainly, the rate was 35 lb. per hour per sq. ft. of grate area. There were no signs of this rate being too high. Observation of the reaction zone revealed little channelling except with breeze. Clinkering was of small account.

Recently the producer was closed down for inspection. The clinkering which took place and fused into the brick lining was not serious.

During the tests little trouble occurred, though different types of fuel were used. One exception to this was when breeze was utilised. A small run-through occurred. Greater supervision is required when using this fuel. Otherwise deterioration in the quality of gas produced can occur as a result of clinkering.

Thermal efficiency figures are given in Table 2. The

TABLE 1.—GENERALISED RESULTS

Test Number	1	2	3	4	5	6	7
Duration of test (hours)	96	96	144	96	144	72	72
Air blast rate (cu. ft./hr.)	35,000	60,000	65,000	71,000	74,000	74,000	65,000
Type of Fuel: Grading %							
+ 1 in.	62.0	69.0	56.0	60.0	66.0	7.0	51.0
¾ in.—1 in.	13.0	6.0	8.0	7.0	7.0	32.0	5.0
½ in.—¾ in.	13.0	13.0	14.0	14.0	11.0	44.0	9.0
¼ in.—½ in.	10.0	11.0	13.5	12.0	9.0	10.0	8.0
Less than ¼ in.	2.0	1.0	8.5	7.0	7.0	7.0	27.0
Dry fuel used daily (tons)	4.20	8.82	9.61	10.42	11.40	11.60	9.40
Analysis of Dry Fuel:—							
Ash	10.0	8.9	8.4	9.0	9.4	9.0	11.9
Fixed carbon	89.0	88.8	89.2	88.5	88.8	89.5	85.2
Calorific value (B.Th.U./lb.)	13,200	13,380	13,400	13,350	13,250	13,380	12,650
Steam in primary air (lb./lb. fuel)	0.42	0.47	0.46	0.46	0.47	0.47	0.50
Cross section of producer (sq. ft.)	31.0	31.0	31.0	31.0	31.0	31.0	31.0
Carbon gasified/sq. ft. of grate area	13.0	26.5	28.8	31.4	34.4	35.0	27.3
Analysis of Prod. Gas: (%)							
CO_2	5.9	4.8	5.2	5.5	5.2	4.8	5.5
CO	27.5	28.7	28.4	28.3	28.3	28.8	27.6
H_2	10.0	10.0	10.0	10.9	10.7	10.4	9.6
CH_4	0.2	0.3	0.2	0.2	0.3	0.3	0.2
N_2	56.4	56.2	56.2	55.1	55.5	55.7	57.1
Average ash bed depth (ft.)	2.5	2.5	2.75	3.0	3.0	3.6	2.25
Net carbon gasified	83.0	86.5	87.0	86.3	86.5	86.5	81.8
Producer gas output (cu. ft./100 lb.)	8,110	8,150	8,200	8,150	8,180	8,160	7,930
Gross calorific value	120	126	125	127	127	127	121

TABLE 2.—Heat Balances, %

	Test No.:	1	2	3	4	5	6	7
Input								
Heat of combustion of fuel (gross)		100.0	99.18	99.18	99.18	99.18	99.18	99.18
External steam requirements		0.0	0.82	0.82	0.82	0.82	0.82	0.82
Output								
Heat of combustion of producer gas		70.6	73.0	72.9	73.7	74.0	73.9	72.0
Sensible heat of hot gas		12.8	18.4	18.6	18.5	18.7	18.6	19.6
Latent heat of water of combustion of gas		3.0	3.0	3.0	3.0	3.0	3.0	2.4
Latent heat of undecomposed steam in gas		2.3	2.2	2.2	2.0	1.9	1.8	2.0
Heat of combustion of ashes		4.5	1.2	1.2	1.2	1.1	1.1	1.3
Heat of combustion of dust		0.8	0.9	0.9	0.9	0.9	0.9	1.2
Surplus from water jacket		3.6	—	—	—	—	—	—
Losses (by diff.)		2.4	1.3	1.2	0.7	0.4	0.7	1.5
Hot gas efficiency (gross)		86.4	95.3	95.5	95.3	96.4	95.5	94.0
Hot gas efficiency (net)		83.4	92.4	92.6	92.3	93.3	92.6	92.2
Cold gas efficiency (net)		70.6	73.6	73.5	74.3	74.6	74.4	72.6

TABLE 3.—Cost of Manufacture

Data	215 therms/ton 4.2 tons/day	220 therms/ton 8.8 tons/day	220 therms/ton 9.6 tons/day	220 therms/ton 10.4 tons/day	220 therms/ton 11.4 tons/day	220 therms/ton 11.4 tons/day	212 therms/ton 9.4 tons/day
Fuel Coke 81s. 0d./ton	4.52	4.41	4.41	4.41	4.41	4.41	3.20
Breeze 34s. 3d./ton							.58
							3.78
Capital Costs							
Present-day cost £10,000							
5.2% of £10,000 = £520 (295 days L.F.)	0.47	0.22	0.20	0.18	0.17	0.17	0.22
Water (including dust seal) 1s. per 1,000 gal.	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Maintenance £500 per annum (295 days L.F.)	0.45	0.21	0.19	0.18	0.16	0.16	0.21
Electricity, 1d./kW	0.04	0.02	0.02	0.02	0.02	0.02	0.03
Labour 2 hours per shift, 3s. 5d. per hour (295 days L.F.)	0.34	0.16	0.14	0.13	0.12	0.12	0.16
Total, pence	5.83	5.03	4.97	4.93	4.89	4.89	4.41

hot gas efficiency, especially on high loads, is high. This is due to the sensible heat retained in the gas. On a low load, more combustible matter was entrained in the ashes. Also, a large amount of surplus steam was produced in the water jacket.

Above half load, the producer is not self-sufficient in steam requirements. External steam is used intermittently on the producer rodding holes, but this amount is negligible.

The test with a proportion of breeze was very successful. However, the use of breeze often results in poor quality gas and a high sensible heat content. The difficulty lies in preventing the reaction temperature rising beyond its safe limit in isolated patches of the fuel bed due to channelling.

The Question of Economics

Table 3 gives the cost of manufacture. The costs are based on the layout at Salford with capital costs (£10,000 each producer). The actual capital cost of the producer on test was £7,400 in 1949, which would have given a more favourable result. Even so the present cost is low, and the difference by employing the producer on maximum load can be seen.

Maintenance charges have to some extent been adjusted since the future requirements will probably be greater than at present. A regular and frequent inspection of the linings of the producers is most important. The brickwork on the top of the water jacket soon wears and cracks away, and the jacket becomes damaged. The producers should be taken-off for inspection every four months.

The cheapest gas made was when using 30% breeze. It was not, however, on a maximum blast rate. Granted this, an even lower cost might have resulted. Operation of the producer on higher blast rates using the same amount of breeze may give more serious trouble. Clinkering would be inevitable, and setting temperatures would be more difficult to maintain.

As many producers as possible should be kept on maximum load. On present-day capital costs it would appear that the best economic consideration with this particular layout is to have four producers working continually (that is using 44 tons per day on this plant). This would suggest that the hot gas producer is more suitable than larger producers for medium sized plants.

The producer used for dilution purposes with a redesigned gas offtake would only be worthwhile if attached to a battery to give the optimum number of working producers as regards labour charges, one man being able to operate four producers satisfactorily.

In certain circumstances, where extra steam requirements necessitate a new boiler installation, augmentation of the waste heat boilers from the producers would probably be an economic proposition; but breeze-burning Lancashire boilers will, of course, generate steam at lower cost.

(*Other Abstracts to follow*)

MIDLANDS JUNIORS—(*concluded from p.287*)

well be along these lines. For the present there is a considerable amount of accounting information and statistics available to management. One of the difficulties is to find time to absorb the information available.

DISCUSSION

Mr. S. Brockbank (Newcastle-under-Lyme), talking of depreciation charges, considered that the estimated life of certain plant erred on the generous side; and he gave examples. Engineers had to plan ahead and did not carry unnecessary stock. There was, of course, little point in accountants showing engineers figures of comparative costs unless the engineers had the opportunity of meeting to discuss these differences.

Mr. Shaw said he was interested to hear that Mr. Brockbank considered some depreciation periods wrongly calculated. It was bad accountancy to depreciate plant at too low a rate. It was much better to err on the other side, especially as the cost of replacement would be much higher.

Mr. H. J. Reynolds (Wolverhampton) said that he would like to see a wider distribution of statistics, and suggested that some figures should be given out at works committee meetings when every department was represented. In this way interest could be stimulated and better results could be achieved.

Others who took part in the discussion included **Messrs. J. A. W. Stretton** (Wales Gas Board), **A. W. Sanders** (Leicester), **F. J. Kimble** (Birmingham) and **W. Harris** (Leicester).

Mr. L. H. Bradley (Birmingham) proposed a vote of thanks to the author, and **Mr. Brockbank** seconded.

HOTELYMPIA
in
PICTURES

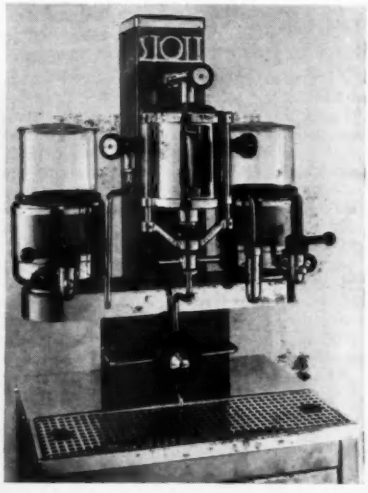
This year's Hotel and Catering Exhibition closed on Friday after a very successful run. The Gas Council and a large number of manufacturers of gas appliances made a good show for gas, and several new models of singular modernity and glamour made their appearance. On this page we can do no more than give a selection of pictures of noteworthy features.

Above is a view of the Gas Council stand, showing the demonstration theatre and visitors' lounge with display of equipment. Daily cookery demonstrations were a feature of the exhibit.

On the stands of R. & A. Main, Ltd., special notice was taken of the new No. 93 range and new gas grillers and toasters. A No. 222 in grey dapple was shown as a live model, its rapid heating up attracting favourable comment. The popular deep fat fryer, the GF. 91/R, was seen in standard form and also with the addition of a stainless steel chip box and cover now available as an extra.

A view of the Radiation stand showing, on the left, the Savoy griller No. 18; in the centre the Keswick steamer 4158, White Lady hotcloset, two No. 5136 Stratford ranges, a Chester range No. 2751/2, as supplied in large numbers for the school feeding services, and a Kingfisher fryer. On the right are two stockpot stands, Nos. 1324 and 18/53. The Stratford range and the stockpot stand 18/53 were on show for the first time.

With the aid of torchlight a visitor to the Gas Council stand examines a salamander. There was a strike of contractors' electricians in the early days of the exhibition, and torches were provided for the attendants in the interests of safety for visitors.



The design of the Connoisseur café set just introduced by Stotts of Oldham struck a new note in catering equipment styling. The Connoisseur has an output of 270 pints of boiling water for tea making and can infuse 48 pints of black coffee per hour.

Trade News

Highest Discharge Loader

This photograph shows two 'High Discharge' Merton overloaders standing beside a standard model. The buckets of these machines discharge at a height of 12 ft. 6 in., as against 8 ft. 6 in. on the standard model, and the concessionaries, Mackay Industrial Equipment, Ltd., of Feltham, state that this discharge height is higher than that of any other tractor mounted loader. The straight line loading principle which the Merton overloader originated—loading

the bucket at the front, conveying it over the driver's head and discharging at the rear—is now well known and achieving wide approbation for fast loading. These 'High Discharge' machines have been supplied by Scottish Land Development Corporation, distributor in Scotland for the Merton Overloader, to Scottish Special Housing Association. They are being used to load the hoppers of swing/weightbatching machines which are being employed in the construction of 'no fines' houses.—*Mackay Industrial Equipment, Ltd., Faggs Road, Feltham, Middlesex.*

Ultrasonic Thickness Measurement

In chemical engineering processes is the fact that the thickness of pipes, pressure vessels, boilers, and similar plant must be checked constantly. Such thickness measurements are usually difficult to make. For example, the thickness of the plates forming a boiler cannot simply be measured by applying a ruler or a micrometer; it is usually necessary to drill a hole in the material or to dismantle the plant. Since such checks must be carried out periodically, the annual costs of inspection are high, and even these may be dwarfed by the costs arising from loss of production when such plant is closed down for inspection.

Recently introduced is a thickness gauge which can measure, in a matter of a few minutes, the thickness of walls only one side of which is accessible. This gauge generates an ultrasonic signal (that is to say, at a frequency too high to be detected by the human ear) and injects this signal into the material being gauged by means of a crystal probe, which is held in close contact with the material. The signal is reflected from the far, inaccessible surface of the material as light is reflected by a mirror, and the reflected signal is picked up again by the same probe. The outgoing and returning signals interfere with each other and under certain conditions resonance occurs, in other words, the outgoing and incoming waves reinforce each other. These conditions depend on the one hand on the thickness of the material (which determines the length of the path of the signal) and on the other hand on the wavelength of the signal. For a given thickness of material there will be a basic resonance when the wavelentgh of the signal equals twice the wall thickness, and there will be successive resonances for simple divisions of this wavelength, the so-called 'harmonics.'

The ultrasonic thickness gauge has proved itself a highly useful tool for deciding when routine maintenance should be carried out.—*Dawe Instruments, Ltd., 83, Piccadilly, London, W.1.*

'PumPak'

The Sigmund 'PumPak,' the latest addition to the extensive range of centrifugal pumps manufactured by Sigmund Pumps, Ltd., introduces a new standard in the design and performance of close-coupled electric pumping sets, and in an outstanding example of good hydraulic engineering practice and Sigmund specilisation applied to the single shaft technique of centrifugal pump design. All the proved best features of integral construction are incorporated in this new unit with additional exclusive refinements developed by the firm.

The two principal features which distinguish the 'PumPak' from other close-coupled pumping sets are the Sigmund stator pack service, and the special ventilation arrangement. In the usual type of integral pump the difficulty of replacing the stator in case of electrical breakdown is often the principal objection to the application of a close-coupled

The drip-proof version of the new Sigmund 'PumPak' range of electrical integral pumps.

unit. The Sigmund patented method of withdrawing the stator, and the special stator pack replacement service, obviate this objection. The stator housing is so designed that it can be removed complete with stator without disturbing the pump in any way, it being only necessary to disconnect the leads to the terminal box and remove four nuts to enable the whole unit to be completely withdrawn.

Stocks of each size of 'PumPak' stators are held at the makers' works so that in the event of an electrical failure developing in the set, a replacement stator can be despatched promptly, thereby enabling the pump to resume duty with the minimum of delay, inconvenience, and expense.

The withdrawal and replacement of the 'PumPak' stator can be carried out in a matter of minutes by comparatively unskilled labour, as the form of construction obviates any possibility of misalignment.

The importance of adequate ventilation has been specially studied, and the cooling arrangement is another Sigmund patented feature. Cool air is drawn through the entire motor by a fan mounted on the pump side of the stator. A stream of air circulates around the pump side bearing, effectively cooling the bearing and preventing the entry of any liquid into the bearing housing.

The initial 'PumPak' range now in full-scale production covers units from 1½ to 15 H.P. at 1,450 and 2,900 R.P.M. with capacities up to 500 gal. per min. and heads up to 175 ft., giving a wide selection of units. An additional series of fan-cooled and small types will shortly be available enabling the potential user to meet any specific requirement.

In addition to the standard cast iron, bronze-fitted pumps, 'PumPak' units are supplied with cast iron casing, and bronze impeller, all-iron construction, all-bronze hydraulic parts, and, in certain types, with stainless steel hydraulic parts. The unit operates efficiently in any desired position, is simple to install, and gives an excellent all-round performance at low upkeep cost. Its extreme adaptability enables it to be advantageously applied to a diversity of service applications in many fields.

Plant engineers and all contemplating the application of an integral electric pumping set will find much of practical interest, and advantage, in a close study of the many unique features offered by the Sigmund 'PumPak.'—*Sigmund Pumps, Ltd., Terminal House, Grosvenor Gardens, London, S.W.1.*

Technicalities of Soldering

Five technical publications have reached us from Grey & Marten Ltd. No. 1 deals with soft soldering and contains notes on the recommended practice for cleaning and fitting parts for soldering and a guide to the selection and use of fluxes for soldering special alloys. No. 2 is concerned with the soft soldering of aluminium and includes notes on surface treatment and tinning. Amalgam fusible alloys are covered in Publication No. 3, which sets out recommended methods for the use of amalgam alloys for tube bending. Amalgam bearing metals and silver soldering and brazing are covered in Publications Nos. 4 and 5.—*Grey & Marten, Ltd., City Lead Works, Southwark Bridge, London, S.E.1.*

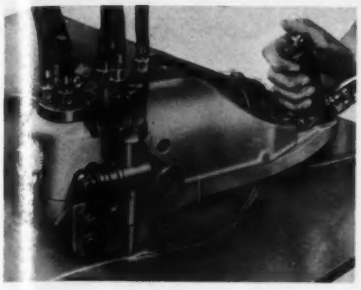
'Bantam' Cutting Machine

The 'Bantam,' for straight line and circle cutting, is the latest of the British Oxygen Company's cutting machines, and also the lightest, weighing only 22¾ lb., including cutter. Designed as a 'maid of all work,' it is, although small, one of the sturdiest machines of its kind ever produced and has many of the advantages of much larger and more expensive equipment.

With the Bantam an operator can cut mild steel up to 2 in. thick, and, when used in conjunction with the radius bar, circles of between 3 in. and 45 in. diameter. For bevelled edges the cutting head is adjustable, enabling an incline cut to be made at any angle up to 45°. It is also adjustable for lateral movement and height.

The cutter uses the 'Cutogen' one-piece nozzle which gives clean machine-finished cuts on slow curves when fre

cutting. For this purpose the Bantam is steered by a handle at the rear of the



The 'Bantam,' steered by hand, follows a chalk line marked on the plate.

machine and it can then be made to follow curves marked upon the plate surface. The castor trailing wheel can be locked for running on a track and disengaged for circle and profiling cutting by the simple adjustment of a locating screw. A 3-ft. light alloy track is provided with the machine and further lengths can be bought separately for extending it.

There is a reversing switch for straight cutting when mounted on the track, and to enable the nozzle to be quickly lined up over the work a cross traverse arm is fitted with a quick acting locking lever, a refinement not usually found on a machine of this kind.

All steel parts are oxidised to prevent rusting, the light alloy parts anodised, and the attachments chromium plated.—*British Oxygen Co., Ltd., Bridgewater House, Cleveland Row, St. James's, London, S.W.1.*

Wiggin Nickel Alloys

'Wiggin Nickel Alloys' No. 24 contains an illustrated description of a unique large-scale experiment in lining a reservoir with rubber. Other articles deal with Monel ragbolts, pipelines of uniform wall thickness, and the high speed cutting of the 'Nimonic' alloys. Copies may be obtained, free of charge, from *Henry Wiggin & Co., Ltd., Thames House, Millbank, London, S.W.1.*

Fork Lift Trucks

George Cohen Sons and Co., Ltd., head of the '600' Group and already operators of Britain's largest contractors' plant hire fleet, are taking a hand in the fork-lift truck hire business. The fork-lift trucks they offer are diesel-engine driven machines having a lifting capacity of 2 tons to a height of 12 ft. These 'Stacatrucs,' as they are called, are backed by a first-class maintenance service.—*George Cohen Sons and Co., Ltd., Cunard Works, Chase Road, London, N.W.10.*

Chamberlain Industries

Chamberlain Industries, Ltd., have made an agreement with Walter P. Hill, Inc., of Detroit, Michigan, U.S.A., design and development engineers making special purpose machinery, principally for the production and testing of engineering parts made from tube and plate. The agreement covers the manufacture by Chamberlain Industries, Ltd., of Hill products and their sale outside the U.S.A. Development work on prototypes has been proceeding at Staffa works for several months. The first machine to be marketed under this agreement will be a new type of production bender for small tubes and other sections.—*Chamberlain Industries, Ltd., Staffa Works, Leyton, E.10.*

Shooting the Flames

We have had demonstrated to us the 'Antifyre Pistole' fire extinguisher—a portable and highly-concentrated piece of fire-fighting equipment. The gun, which, with charge, weighs only 3½ lb., is easily handled and can be re-charged in a matter of a couple of seconds. The charge, when exploded, de-oxygenates, blankets, and beats-out fire. In effect it shoots the fire out, and one charge will extinguish a 20-ft. spread of flame in one second. No liquids or gases are employed. The discharge is a fine cloud of powder, in the path of which no fire can live. The efficiency of the gun is not affected by heat, cold, or moisture, and the charge is refilled free when used on authenticated fire. Hence no maintenance costs are involved. It seems to us, from demonstration, to be capable of dealing with many types of fire emergency, and it should prove of great interest and use to the gas industry. As a matter of fact, many gas undertakings have already included the 'Antifyre Pistole' in their safety measures.—*Antifyre, Ltd., Shaftesbury Road, Acton, London, W.3.*

Dowty Self-Sealing Coupling

The Dowty self-sealing coupling provides a speedy and efficient method of making a pressure pipe joint which is completely leakproof. It is easily coupled or uncoupled by hand without loss of fluid or risk of an airlock.

The male half of the coupling embodies a simple and practical arrangement of a piston with two bonded rubber rings, and a mushroom-headed valve which, when junction is effected, actuates a conical valve in the female half. The piston and the conical valve are spring loaded to obviate airlock when coupling and ensure a clean and instantaneous cut-off during uncoupling.

For working pressures up to 3,000 lb. per sq. in., and suitable for use with most fluids, the range is comprehensive, all conventional sizes being included.

No tools are required to couple or uncouple the units, hand tightening of the eared nut being adequate to ensure a leakproof joint. Ease of servicing is another important feature of the design ensuring reduced operational costs. Each unit is easily dismantled for inspection and separate half couplings can be supplied.

For any industrial application, the Dowty self-sealing coupling provides the answer to problems in a number of fields where a rapid leakproof method of joining hydraulic pressure lines is required. —*Dowty Auto Units, Ltd., Aschurch, near Tewkesbury, Glos.*

The 'Reciprojet'

Thirty years experience of air filtration problems and a considerable amount of experiment have combined to produce the Visco 'Reciprojet' self-cleaning air filter. This filter is designed for use in situations where the atmosphere has an exceptional dust load. It is a development from the 'Standard' and 'Oilspray' types and it meets all the demands which can reasonably be made on such equipment.

Applications have been made for patents and for registration of the name 'Reciprojet.'

The principal features are:—

(1) Automatic operation controlled by time switch ensuring that each cell is thoroughly cleaned at regular and frequent intervals. This avoids chokage of filter cells and maintains constant pressure drop under heavy dust conditions.
(2) Double-stage filtration ensuring high efficiency of air cleaning.
(3) Positive cleaning of filter cells without removal by the use of non-choking oil jets.
(4) Definite elimination of oil carry-over.
(5) Continuous cleaning of the oil in the system. Large sludge capacity to minimise need for sludge removal.

—*Visco Engineering Co., Ltd., Stafford Road, Croydon.*

TRADE PUBLICATIONS

The British Jeffrey-Diamond, Ltd., Wakefield, send us a copy of their Catalogue No. 1488, dealing with swing hammer shredders for fibrous materials.

From Imperial Chemical Industries, Ltd., Imperial Chemical House, Millbank, London, S.W.1, we have received a copy of a leaflet of the Company's Metals Division, entitled 'Fyffe's Four Leading Fittings.' This leaflet deals with non-manipulative and manipulative compression fittings and also the pre-tinned capillary fitting.

A handbook (price 3s. 6d., post free) has been produced by the Fan Manufacturers' Association, Ltd., 59, High Holborn, London, W.C.1, to convey a general impression of the fan engineering industry. It does not pretend to refer to all the applications for which fan equipment is supplied. On the other hand, it is, we feel, sufficiently comprehensive to fulfil its purpose as a link between the industry and those who are using fan equipment.

'Design and Construction in Steel Plate' is the title of a new publication (No. 53) by Whessoe, Ltd., 25, Victoria Street, London, S.W.1. The brochure is designed to survey the extent of Whessoe activities in the oil, gas, chemical, steel, and other industries. It is based on the simple theme indicated in the title. The introduction to the brochure takes the form of a brief survey of the Whessoe organisation with a pictorial representation of the Whessoe shops layout at Darlington. There follow illustrated descriptions of the various forms of capital plant Whessoe manufacture. Of particular interest to gas engineers will be the pages covering the various processes and storage methods for the gas, coke oven, and allied industries. Copies of this brochure are available on application to Whessoe, Ltd., Darlington.

A mammoth catalogue of tools and supplies by Buck & Hickman Ltd., may be obtained from 2-8, Whitechapel Road, London, E.1, by interested trades and manufacturers free of charge. A large number of these catalogues are issued annually to regular users, but a few copies are sent to *bona fide* applicants. The 1953 edition of 1,267 pages has been designed to act as a standard work of reference as well as a catalogue. The first edition, published some 86 years ago, consisted of only 32 pages. In addition to the price lists and illustrated specifications of small tools and supplies, formulæ and tables are included for reference in shop problems. Detailed equivalents of inches and millimetres, English and metric weights and measures, conversion factors, decimal equivalents of all gauges in general use, formulæ for screw threads, pipe flanges, copper tubes, etc., and mensuration formulæ are given. Many machine tools are omitted from the book, as a separate catalogue is issued relating to that department of Buck & Hickman Ltd.

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The coal pier at Southend gasworks illuminated for the centenary celebrations.

Centenary Celebrations

We were among nearly 200 guests of the Chairman and Members of the North Thames Gas Board at a reception in the Hope Tavern at twelve of the clock on January 27 and thereafter at a luncheon in Garon's Banqueting Hall, the occasion being the one hundredth anniversary precisely of the introduction of gas in the town of Southend-on-Sea. The invitation card stated that 'a carriage will transport the ladies and gentlemen from the Hope Hotel to the restaurant' and we have to confess to a little disappointment at finding the carriage to be a very modern motor coach in contrast to the old-world atmosphere of the earlier part of the proceedings.

At the Hope Tavern (long since renamed the Hope Hotel), where, as recalled in the 'JOURNAL' last week, the first meeting of the Southend Gas Light and Coke Company was held exactly 100 years earlier, the guests were received by Mr. Michael Milne-Watson, Chairman of the North Thames Gas Board, Mr. F. M. Birks, Deputy Chairman, and most of the chief officials of the Board. In the actual room where the first meeting took place there was an impressive exhibition showing the changes that have taken place in gas manufacture, distribution, and utilisation during the century. The exhibits included the original minute book of the Company, the personal diary of Mr. Charles Woosnam, who moved the resolution to form the Company and was afterwards a Director from 1854 until his death in 1906, and Chairman from 1882 until 1901, illustrations of some of the earliest lighting and other appliances, and examples of the latest cookers, water heaters and other domestic equipment as well as information about the industrial uses to which gas is applied in the Southend District.

The number of guests at the Hope Hotel was limited by the available accommodation, and there was therefore another and larger reception immediately before the luncheon at Garon's banqueting hall. The exhibition has since been transferred from the Hope Hotel to the public library, where it is on public view.

Different Name—Same Spirit

MR. MICHAEL MILNE-WATSON, proposing the toast of the guests, recalled that it was on January 27, 1854, that the Southend Gas Light and Coke Company was born, and although there was no record of the temperature on that day he rather liked to feel that it was as cold a day as the present one that brought Southend to its senses and made it possible to build a gasworks. The name of the Company had been changed several times but the spirit had remained and the North Thames Gas Board was the lineal successor to the original Company.

The Centenary gathering was representative of many interests that existed in go-ahead Southend, too many in fact to be mentioned by name, but he felt a special welcome was due to the first citizen—the Mayor, Alderman E. N. Selby—the Aldermen and Councillors, including two Councillors who were employees of the Gas Board, the always helpful permanent officials of the Corporation, leaders of religious denominations, businesses and professions, and representatives of women's interests—who were blushing becomingly. He also welcomed Mr. S. J. McAdden, Member of Parliament for Southend East, who exemplified the benevolent but watchful eye of Parliament over nationalised industries. Mr. McAdden took a strong personal interest in the affairs of gas consumers of Southend, as was obvious from their spirited correspondence.

Mr. Michael Milne-Watson, Chairman of the North Thames Gas Board, with Mr. A. Woosnam, the Mayor, and Mr. McAdden, M.P.

Among others who were very welcome were Mr. Edwin Bayliss, Chairman of the Gas Consultative Council, Councillor Palethorpe, Chairman of the Essex District Committee, and other members, and Mr. F. G. Brewer, Secretary of the Gas Council—another body which kept a watchful eye on the Board.

Special mention must be made of the presence of Mr. A. Woosnam, son of the late Mr. Charles Woosnam, who moved the resolution to form the Company at the meeting held 100 years ago. Mr. Woosnam, Senior, was a Director from 1854 until his death in 1906, and was Chairman of the Southend Company from 1882 until 1901. Another family connection with the early days was represented by the presence of Mr. J. H. Burrows, grandson of Mr. J. H. Burrows, who was Chairman of the Company from 1915 until 1931.

A number of the guests had already met at the Hope Hotel, or the Hope Tavern as it was originally known, where the first meeting took place in 1854, and he wished to apologise to all who were not included in that party, due solely to lack of space. The Hope Hotel was an admirable place but was simply not large enough for them all.

The original Company had a capital of £1,500 and served a township with a population of only 8,000. A great thing was happening in that memorable year—a railway was being built between London and Southend. In the following year the Company started business with the lighting of 120 burners and thus originated the illuminations of Southend.

Today the County Borough of Southend had a population of some 150,000, and the Southend District of the North Thames Gas Board served 125,000 consumers. The Company employed 14 men in 1854; today the Board employed 238 in the Southend District. Reliable statistics for the make and sale of gas in the earliest years were not available but the earliest records showed that in

1877 the Company sold 11 mill. cu.ft., compared with the 6,000 mill. cu.ft. sold last year.

'Yesterday, January 26,' continued Mr. Milne-Watson, 'the North Thames Gas Board sold its record day's output for all time of 348 million cu.ft. in the one day.' Much work had been done in recent years in re-equipping works and laying new mains to meet the ever-increasing demand for gas. The Board was always trying to improve its service to the consumer. The undertaking started as a lighting company; now it supplied gas for cooking, water heating, catering, various processes in industry, and—impossible as it might have seemed to the pioneers of 1854—for refrigeration from 'the little flame that freezes.'

There had been astonishing changes in Southend itself. The population had become more permanent and, although the holiday period brought its peak loads there was a more even demand for gas throughout the year. The Gas Board was very conscious of the strong civic spirit in Southend and was proud to serve such a community. That spirit was probably never better exemplified than during the disastrous floods a year ago when everybody connected with the undertaking, clerical as well as manual, volunteered for duty in order to maintain a service.

The Board's determination was to continue to render an up-to-date and imaginative service. It had the utmost confidence in its local chief officers, Mr. J. A. Rose, Station Engineer, and Mr. A. A. Hall, the District Manager responsible for sales and service, who with their staffs would always be at the service of the consumer.

The Mayor, ALDERMAN E. N. SELBY, J.P., responded to the toast and said he noticed that the Chairman had refrained from mentioning the price of gas, but if his arithmetic was correct he believed he was right in saying the present price was about twice as much as in 1854—a very reasonable figure bearing in mind the greater increase in the cost of most other commodities. The price of a first class quarterly season ticket between Southend and Fenchurch Street in the earliest days of the railway was £6 6s., and today it was £20 8s. 6d., or nearly 3½ times as much. Another instance of a change in values was that the Company's original capital of £1,500 would scarcely have been sufficient to pay for the repair of the wall alongside the works which was damaged in last year's floods. It was true that the County Borough endeavoured to be as go-ahead as possible, and he felt the local authority could take some credit for the municipally operated gasworks at Shoeburyness which continued as a separate undertaking right up to nationalisation. For some years before nationalisation the the Corporation as owners of the local electricity undertaking had been in competition with the Gas Company. He hoped the monopolies that now existed in both industries would be able to carry on with the same spirit and the same personal atmosphere that had marked the activities of their predecessors over so many years.

Mr. S. J. MCADDEN, M.P. for Southend East, also responded in a humorous speech in which he remarked that one of the greatest things he admired about the Gas Board in the Southend District was that it had maintained that personal contact which he believed to be so important. Its local officers identified themselves with local interests and were always welcome on social occasions.

Ascot Silver Jubilee

ASCOT Gas Water Heaters, Ltd., held their Silver Jubilee Dance at the Seymour Hall on January 20, and during the course of the evening, the Chairman, Lord Limerick, presented clocks to Mr. G. N. Behr and Mr. F. E. Noot, in recognition of their 25 years' service. Presentations were also made to the best engineering and trade apprentices of the year.

A cake, made in the form of an Ascot badge and bearing 25 candles, was wheeled into the hall, accompanied by two Ascot employees in fancy dress representing water heaters. The Chairman performed the ceremony of cutting the cake, which was then wheeled out, and finally cut into approximately 900 pieces.

Mr. Behr joined Cookers and Geysers, the precursor of Ascot, in 1927, and acted for some time as personal assistant to the late Dr. Bernard Friedman, the founder. In 1934, when the Ascot Company started to open branch offices to cover various areas of Great Britain, Mr. Behr was appointed London Sales Manager. He served with the forces throughout the war, and in October, 1945, he rejoined Ascot Gas Water Heaters in his former capacity, a post which he filled until, in 1949, he was appointed Manager for the areas covered by the Eastern, North Thames and South Eastern Gas Boards. His appointment as Home Sales Manager was made early in 1953.

Lord Limerick (right) congratulating Mr. George Behr on his long service, in recognition of which he presented him with a clock.

Mr. Noot joined Cookers and Geysers in 1928, and was actively engaged in the manufacture of water heaters at their factory in Hither Green. With the growing demand for water heaters, it was found necessary to train more and more representatives and also to assist the Gas Undertakings on installation work. Mr. Noot pioneered this work, and for some time travelled all over the country, giving lectures and instructing fitters. At the outbreak of war, he was transferred to Neasden to assist in the changeover from the manufacture of domestic appliances to aircraft components. Since the war, his activities have been confined mainly to the London area, supervising the London service engineers and acting as practical instructor for trainees attending courses at Neasden.

The engineering apprentice of the year is Clive Gary, aged 20, who has won the award for the third year running. In 1953, in his third year of apprenticeship, he obtained the Ordinary National Certificate in Mechanical Engineering. The trade apprentice of the year is Eric Shaw, aged 21. He is in his last year of apprenticeship, and in 1953 passed the second year of the City and Guilds examination.

Burns Night

WHETHER any of the great national industries are more intimately linked with Scotland than the gas industry is questionable, but from William Murdoch onwards many Scotsmen have travelled southwards to make a notable contribution to its development and vitality. Consequently many Scots, exiled from their native land, unite in the celebration of Burns' Night, and this year Mr. J. Hunter-Rioch, General Manager of the Cambridge Division of the Eastern Gas Board, was in good form when he proposed the principal toast, 'The Immortal Memory of Robert Burns.'

As one who was born in Kincardineshire within almost a stone's throw of the estate of Dunnottar where the father of Robert Burns spent the first 27 years of his life, Mr. Hunter-Rioch was particularly qualified to speak of the famous poet whose renown has spread throughout the world and whose birth is commemorated more universally than that of any other human being. An example of the increasing popularity and appreciation of Burns was the new book by William Keane Seymour published on the anniversary of Burns' birthday under the title, *Burns in English*, in which the author seeks to make Burns more intelligible to the English reader. This, said Mr. Hunter-Rioch, illustrated that the English think so much of Burns that they want to understand him better.

Elliott Long Service Association

FEW industrial concerns, especially in the engineering industry, can boast of over a century and a half of uninterrupted business. Elliott Brothers (London), Ltd., manufacturers of electrical electronic, and process control instruments, have that distinction, for the firm was founded by William Elliott in 1800.

The Elliott Long Service Association, for which the qualifying period in the case of men is 25 years service, and that of women 20 years, was inaugurated some years ago by the directors of the company in order to establish a bond between those still working and those retired. The present membership stands at 178.

On Friday, January 22, the Association held its annual dinner at Pynes Restaurant, New Cross, with the President of the Association, Mr. W. Phillips, (57 years service) in the chair.

The toast to the company was proposed by Mr. C. M. Hopwood. In his response on behalf of the company, Mr. L. Bagrit, Managing Director, drew special attention to the recent Government White Paper on the employment of older persons. He said that it was his belief that the company was the leader in this particular movement for in the White Paper reference was made to the company as having done outstanding work in this field. The question of employment of older persons was not to be treated lightly, Mr. Bagrit continued, but one to which serious consideration should be given. In the interests of the Nation all that could be done must be done to employ the strength, intelligence, and ability of these older people.

Mr. L. W. Pettitt proposed the toast to the President of the Association, Mr. W. Phillips, who replied.

Damages Against Belfast Corporation

DAMAGES totalling £9,675 were awarded in the Northern Ireland Court in claims arising out of a gas explosion in the offices of Shell-Mex and B.P., Airport Road, Belfast, on April 11, 1949. In the Queen's Bench Division before Mr. Justice Sheil and a jury, Dorothy V. Callindur, 9, Loopland Crescent, Cregagh, sued Belfast Corporation as gas undertakers for damages for personal injuries she sustained in the explosion. The Corporation admitted liability and the question for the jury was the amount of damages.

Mr. H. A. McVeigh, Q.C., for the plaintiff, said the explosion occurred as the result of a fractured gas main which ran outside the premises. Corporation workmen were repairing it when gas which had leaked from it entered the Shell-Mex offices where an explosion took place. As a result a number of people were injured, some seriously.

There had been a test case to establish liability which, however, did not concern the present jury.

Counsel said the plaintiff had sustained serious injuries to both feet which resulted in permanent limitation of movement of the right foot.

After long hospital and surgical treatments she returned to work under difficulties in June, 1951. She still suffered pain and had to use sticks to walk, but she stuck to her work. At times her right leg went numb and on one occasion she fell and fractured her wrist. For the past five years the plaintiff suffered pain and disability and had been debarred from dancing and other amenities in the life of a young girl. She was 20 years old when the accident happened, and was, therefore, entitled to substantial damages.

After medical evidence the parties came to terms and plaintiff was awarded by consent £2,250 and costs.

In the High Court Mrs. Eileen E. Thompson, 5, Clonaver Crescent North, Belfast, who before her marriage had been employed as a shorthand typist in the offices of Shell-Mex and B.P. Ltd., was awarded by consent £2,150 damages for injuries received.

The plaintiff, Miss Bell, as she then was, lost her left eye in the explosion.

In the Queen's Bench Division on the same day a jury awarded John Campbell, 41, Wesley Street, Belfast, £4,650 for injuries sustained in the explosion.

The plaintiff, a foreman driver employed by Shell-Mex, was permanently disabled by severe injuries to his right leg.

Judgment for the amount awarded was entered with costs.

In connection with the same accident, John I. Camerin, clerk, 8, Kingsberry Park, Belfast, who had sustained injuries to his left ankle, was awarded by consent £625.

News in Brief

Long Service.—At a 'get-together' of the employees of the undertakings in the Colwyn Bay Group of the Wales Gas Board, held at the Hydro Hotel, Llandudno, awards for long and devoted service were presented by the Group Chairman, Mr. H. Blythe, to Messrs. D. R. Evans and William Owens, both having completed 40 years' service at Colwyn Bay.

Nine men of the Edmonton and Falkirk Works of R. & A. Main, Ltd., have just completed 50 years with the firm, in which time they have seen their respective works develop into modern, well-planned factories. In the Falkirk group they are: H. Macpherson, foreman moulder, J. Kidd, representative, who are both aged 70, J. Kemp, moulder, 69, P. Black, enameller, 68, and R. Boyd, pattern moulder, 66. At Edmonton they are: F. T. Tydeman, fitter, aged 66, S. Simmonds, foreman inspection and testing, G. D. Tydeman, foreman heavy apparatus department, and J. Barber, rail fitter, all aged 64.

Mr. W. O. Kirkwood, General Manager of the Sunderland Division of the Northern Gas Board, told members of the staff at their annual dinner in Sunderland that a 'phenomenal peak' in appliance sales was reached by the Division last year. The Division had done exceedingly well in 1953 and the credit should be shared among members of the staff. In addition to the sales of appliances, progress had been made in all other branches of the Division's work, particularly in the accounting department, where a new system had been introduced. Mr. Kirkwood was proposing the toast of the guests. The Industrial Relations Officer of the Northern Gas Board, Mr. L. A. Garrett, replied. Mr. John G. Burrell, Chairman of the Social Committee of the Sunderland Division, presided.

The Institute of Municipal Treasurers and Accountants and the Society of County Treasurers have jointly published two booklets dealing with health and children services statistics for 1952-53. Children Services Statistics relates to the various children services administered by local authorities under the provisions of the Children Act, 1948, and the Children and Young Persons Act, 1933. Local Health Services Statistics is concerned with the various services administered by local authorities under the National Health Services Acts.

Purchase Tax.—The Association of British Chambers of Commerce has written to the Chancellor of the Exchequer welcoming the recent purchase tax reductions 'as an earnest of the Government's intentions to make further and more substantial reductions in the Budget.' At the same time, however, the Association points out that, in the absence of any advance statement of Budget policy regarding changes in the tax, the reductions will not have any effect on the falling-off in trade which is expected during the next three months.

Gas Supplies in Wales.—The *Western Mail's* commercial and industrial review on January 18 included a special article by Mr. E. M. Edwards, of the Wales Gas Board on 'Integrating our gas supplies.' The article is largely devoted to the development of the gas grids in Wales, and the different sources of supply from which gas is coming for distribution through the grids. Reference is also made to the technical advisory service of experienced industrial gas engineers which is maintained by the Board to assist industrialists to deal with their fuel problems. The article is illustrated by photographs of the extensions which are being constructed at the Aberavon gasworks and of the grid line from Aberdare to Merthyr.

Permac

METAL-TO-METAL JOINTING MATERIAL

Ever since 1913 "PERMAC," the original Metal-to-Metal jointing, has been holding up difficult joints in Gas Works and on Coke Oven Plants all over the world. Equally suitable for any joint—steam, water, gas, oil, benzol, ammonia, etc.—screw pipe or flange.

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SURBITON, SURREY

ELMBRIDGE 9545

WALTER KING SERVICES

PERIODICALS . . .

GAS JOURNAL. *(Weekly.* Wednesday, By Post, **1s. 5d.**)

The "Gas Journal" has existed as an integral part of the Gas Industry since 1849. Unbiased policy, technical knowledge, accuracy and reliability combine with an extensive news service and modern make-up to make the Journal the leading Gas Industry newspaper.

Annual Subscription (including a copy of the "Gas Journal" Calendar and Directory): Home and Empire, **52s.** ; Foreign, **60s.**

GAS SERVICE. *(Monthly.* By Post, **1s. 2d.**)

"Gas Service" is the specialist magazine for the Sales and Service personnel of the Industry. It covers all aspects of gas service from the holder to the burner. In addition to sound editorials, news items and specially contributed articles, "Gas Service" also reports in the fullest possible manner the activities of the numerous Salesmen's Circles.

Annual Subscription : Home and Empire, **12s.** ; Foreign, **15s.**

BOOKS and ANNUALS . . .

Some current works covering the manufacture, distribution, and sale of gas are :—

KING'S MANUAL OF GAS MANUFACTURE. Now being issued in 10 self-contained sections. Sections available and prices on application.

MANUAL OF GAS FITTING. By R. N. Le Fevre. **30s.**

GAS DISTRIBUTION ENGINEERING. By R. N. Le Fevre **22s. 6d.**

High Pressure Gas Main Construction (Restall), **10s. 6d.**

ANNUALS:—

"Gas Journal" Calendar and Directory, 25s. ; "Gas Service" Pocket Book (1954 Edition) **5s.**

BINDING . . .

In addition to permanently binding subscribers' journals, (particulars and prices for which we shall be pleased to give on application) we can supply TEMPORARY BINDERS for the Gas Journal, Gas Service and King's Manual of Gas Manufacture, thus enabling readers to *bind their copies as received.* The danger of mislaid or damaged copies is eliminated.

Gas Journal temporary binder } . . . . **13s. 3d.** each inc. postage.
Gas Service " }
King's Manual " . . . . . **9s. 9d.** each inc. postage.

PHOTOGRAPHY . . .

Walter King Photographs specialize in Gas Industry photography of every description—work in progress series, plant, appliances, showroom displays, exhibition stands, social and educational visits of all kinds. Tours for various areas of the country can be arranged. First class photography at competitive rates. Full particulars on application.

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PUBLISHERS' NOTICE

The "Gas Journal" is published every Wednesday, price 1/3d.; by post 1/5d.

Subscription Rates: Home and Empire:—52/- per annum; Foreign:—60/- per annum. (Both payable in advance.) A copy of the "Gas Journal" Calendar & Directory is presented each year to continuous subscribers.

Classified Advertisements: All small classified advertisements are charged at 1/9 per line (approx. 7 words)—minimum charge 10/6. A Box Number address occupies 2 lines, and a further 6d. is charged towards cost of postage on replies. Copy must be received by first post on Monday to ensure insertion in that week's journal.

Displayed Advertisements: Rates obtainable on application to the Business Manager. Change of copy for displayed spaces must be received 14 days prior to publication if proofs are required. Type area of inside pages 10" deep × 7" wide; block screen 120.

BUSINESS MANAGER: S. T. CULLEN

MIDLANDS MANAGER: G. B. Torrance, 42, Wychall Lane, King's Norton, Birmingham, 30.

NORTHERN MANAGER: W. Q. Foster, 33, St. Helens Road, Harrogate. *'Phone:* Harrogate 84291.

WALTER KING, LTD., 11, Bolt Court, Fleet Street, London, E.C.4.

Telephone: CENtral 2236-7. *Telegrams:* Gasking, Fleet, London.

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SPECIALLY ACTIVATED OXIDE OF IRON

Oxide supplied on loan or sale outright.
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ESTABLISHED 1873

PALMERSTON HOUSE, OLD BROAD STREET, LONDON, E.C.2.

Telegrams: "Purification, Stock, London." Telephone: London Wall 5077

FIRE!

OUR RECORDS LOST BUT FOR

NU-SWIFT!

"So unexpected, so quickly... blazes everywhere...three old-fashioned extinguishers failed... but reliable Nu-Swift had the fire out in seconds." When will YOU get up-to-date?

NU-SWIFT LTD · ELLAND · YORKS

In Every Ship of the Royal Navy

"KLEENOFF" *

THE COOKER CLEANER

"KLEENOFF"

FIBRE BRUSHES
RUBBER MOPS

"KAY-DEE" *

KETTLE DESCALER

For resale to the public, and in bulk for Works use.

BALE & CHURCH, LTD.

7, CROMPTON WAY, CRAWLEY, SUSSEX

PATENTS

KINGS PATENT AGENCY, LTD.

(Director, B. T. King, A.I.Mech.E., Patent Agent.) Advice, Handbook, and Consultations free. 146a, Queen Victoria Street, London, E.C.4. 'Phone: City 6161.

APPOINTMENTS VACANT

The engagement of persons answering these advertisements must be made through a Local Office of the Ministry of Labour or a Scheduled Employment Agency if the applicant is a man aged 18-64 inclusive or a woman aged 18-59 inclusive unless he or she, or the employment, is excepted from the provisions of the Notification of Vacancies Order, 1952.

NATURAL GAS IN WEST PAKISTAN

REQUIRED by a British company of the highest standing for the distribution and development of natural gas in West Pakistan, A DISTRIBUTION & DEVELOPMENT ENGINEER to be responsible direct to the Resident Manager for distribution of the gas to industrial and domestic consumers in Karachi and elsewhere and for the stimulation of sales generally.

The engineer is required to have the highest technical qualifications, some years of practical experience and personal adaptability.

The post offers unique opportunities for a man of initiative and imagination.

Terms of employment will be commensurate with the successful applicant's qualifications and general suitability. For the right man the advertiser is prepared to pay generously.

Write: Box G.J.258, c/o 191, Gresham House, E.C.2.

WEST MIDLANDS GAS BOARD

WALSALL AND DISTRICT DIVISION

GROUP DISTRIBUTION SUPERINTENDENT—CANNOCK GROUP

(COMPRISING CANNOCK, LICHFIELD AND TAMWORTH DISTRICTS)

APPLICATIONS are invited for the above post, which is based at Cannock.

Candidates must have a sound practical experience in mains and service laying and both high and low pressure distribution. The possession of the Institution of Gas Engineers Higher Grade Certificate in Gas Engineering (Supply) will be an advantage.

The salary will be in accordance with Grade VIII (£585-£665 per annum) of the National Salary Scales for Gas Staffs.

The post is pensionable and the successful candidate may be required to pass a medical examination.

Applications, stating age, qualifications and experience, together with the names of two referees, should be addressed to Mr. E. Hardiker, Divisional General Manager, West Midlands Gas Board, Walsall Factory Estate, Tame Bridge, West Bromwich Road, Walsall, to reach him within fifteen days of the appearance of this advertisement.

F. H. CURETON,
Secretary to the Board.

SOUTHERN GAS BOARD

QUALIFIED ASSISTANT ACCOUNTANT

A QUALIFIED ASSISTANT is required for the Chief Accountant's Office at Southampton. The work will be varied and interesting. A knowledge of modern methods of cost accountancy would be an advantage.

The salary will be within the range of £600-£900 per annum, according to qualifications and experience.

The successful candidate will be required to pass a medical examination and, unless already subject to a Pension Scheme by virtue of the Gas (Pension Rights) Regulations, 1950, will be required, if eligible, to join the Board's Staff Pension Scheme within six months from taking up the appointment.

Applications stating age, education, qualifications, training, experience and present salary, together with a one-page summary of these particulars, should be sent in an envelope marked 'Assistant Accountant' to the Secretary, Southern Gas Board, 164, Above Bar, Southampton, to reach him not later than February 17, 1954.

TOWN COUNCIL OF SPRINGS

TRANSVAAL-SOUTH AFRICA

TOWN ENGINEER'S DEPARTMENT

VACANCY—GAS ENGINEER

APPLICATIONS are invited from suitably qualified persons for the above position on the salary grade £870 × £30—£930 plus a variable cost of living allowance which, at the present time, is £358 per annum for a married man and £179 for a single man. At the present time, therefore, the total salary applicable to a married man is £1,228 × £30—£1,288 per annum. This salary scale is subject to revision with expansion and development of the Gas Undertaking.

The successful applicant will be required to take full control, under the Town Engineer, of the Gas Undertaking, comprising two units of a Carburetted Water Gas plant, each unit being capable of producing 1,000,000 cubic feet of gas per day. He will also be required to assume full responsibility for the reticulation and distribution of gas to both industrial and domestic consumers and must be competent to advise such consumers upon the use of gas.

The successful candidate's fare from the United Kingdom to South Africa will be paid by the Council and it is desired that he be prepared to travel by air. The fare is subject to refund by the successful applicant should he leave the service of the Council, for any reason, before the expiration of two years.

The appointment will take effect from the date on which the successful candidate leaves the United Kingdom.

Candidates must be qualified gas engineers who are fully conversant with the production of both coal and water gas and they must be capable of dealing with all matters relating to both the manufacture and distribution of gas.

The successful candidate will be required to pass a medical examination prior to appointment and to join the Municipal Employees' Association and the Joint Municipal Pension Fund.

The successful applicant will be given the opportunity, if necessary, of acquiring a house under one of the Council's Selling Schemes.

Applications giving full details of training, qualifications and experience, together with *copies* of Testimonials and photographs and details of age and marital status, should be submitted to Messrs. William Coward and Co., 3, St. James's Square, London, S.W.1, England, not later than February 22, 1954.

(Classified Advertisements continued on page 302)

APPOINTMENTS VACANT (ctd.)

WALES GAS BOARD

CHEPSTOW & CALDICOT UNDERTAKING

SALESMAN CANVASSER

APPLICATIONS are invited for the above position at a salary within the Scale Grade 'B' (Provincial 'B') £395/445 per annum or according to experience and qualifications.

Applicants must have had experience in district canvassing and sales, including the preparation of estimates.

The successful applicant will be required to pass a medical examination and to subscribe to the Board's Superannuation Scheme.

Applications, giving personal details, particulars of training and qualifications together with the names and addresses of two referees should reach the undersigned not later than fourteen days after the first appearance of this advertisement.

C. L. SINGLETON,
Engineer, Manager & Secretary.

Gas Offices,
23, St. Mary Street,
Chepstow.

SOUTH EASTERN GAS BOARD

SHIFT SUPERINTENDENT,
EAST GREENWICH WORKS
METROPOLITAN DIVISION

PREFERENCE will be given to candidates who have obtained the Higher Grade Certificate in Gas Engineering (Manufacture) of the Institution of Gas Engineers, or equivalent qualification. They should be capable of controlling the gas production of the Works.

The successful applicant will be required to take charge of the Station and be responsible for the Divisional Gas Production control outside normal office hours.

Salary within Grade X (Met. Area) £695-£795 per annum.

Applications in writing, quoting reference V10/387, and giving full details should reach the undersigned not later than fourteen days after the publication of this notice.

R. J. MCCRAE,
Personnel Manager.

Katharine Street,
Croydon.

EASTERN GAS BOARD

IPSWICH DIVISION

WORKS MANAGER—

CHELMSFORD DISTRICT

APPLICATIONS are invited for the position of WORKS MANAGER at the Chelmsford Works. Salary within the range of £850 to £900 per annum.

Candidates should be Associate Members of The Institution of Gas Engineers or possess an equivalent engineering qualification and should be capable of controlling the day-to-day operation of the Works which has a capacity of 4 mil. cu. ft. per day from Woodall-Duckham Continuous Vertical Retorts and Power-Gas C.W.G. plant and the usual ancillary plant.

The successful candidate may be required to pass a medical examination and to join the Board's Staff Superannuation Scheme.

Applications stating age, qualifications, present position and experience, together with the names of two referees, should be addressed to the undersigned to be received not later than Monday, February 15, 1954.

W. J. COLLINS GARRARD,
Divisional General Manager.

Crane Hill Lodge,
London Road,
Ipswich.
January 25, 1954.

EASTERN GAS BOARD

IPSWICH DIVISION

APPOINTMENT OF

MAINTENANCE FOREMAN,

IPSWICH WORKS

APPLICATIONS are invited from experienced practical men for the position of MAINTENANCE FOREMAN at this Works. The salary will be in Scale A.P.T. VI (Provincial 'A'), £490 to £570 per annum.

Candidates should have served an apprenticeship and it would be an advantage to hold a National Certificate in Mechanical Engineering. Wide experience on gas-works is essential.

This is a staff appointment and the successful applicant will be expected to pass a medical examination and to join the Board's Superannuation Scheme.

Applications are to be sent to the undersigned by February 13, 1954.

W. J. COLLINS GARRARD,
Divisional General Manager.

Crane Hill Lodge,
London Road,
Ipswich.
January 19, 1954.

GAS PRODUCER ENGINEERS with London and Provincial Offices, require designer and/or draughtsman. Previous experience in similar work essential. Applicants should state experience, salary required, age, etc. Apply: No. 181, *Gas Journal*, 11, Bolt Court, Fleet Street, London, E.C.4.

SCOTTISH GAS BOARD

GLASGOW DIVISION

GLASGOW DISTRICT CHEMICAL WORKS

ENGINEERING ASSISTANT

APPLICATIONS are invited for the post of ENGINEERING ASSISTANT in the above Section. Candidates should be experienced in Engineering associated with Chemical Works processes, *e.g.*, materials of construction, steam generation and utilisation plant, distillation plant, washing and extraction plants, pumps (steam and electrical), etc., and be qualified at least to the Higher National Certificate standard and preferably be a Corporate Member of an Engineering Institution.

The post is remunerated, within the National Salary Scales for Gas Staffs, on Grade A.P.T. IX (Provincial 'A') £615-£715 per annum, and is superannuable. The selected candidate may require to undergo a medical examination.

Applications, endorsed 'ENG/CW', giving particulars of age, education and experience, along with the names of two referees, should be in the hands of the undersigned not later than Saturday, February 20, 1954.

D. F. YOUNG,
Divisional Controller.

30, John Street,
Glasgow, C.1.

MISCELLANEOUS

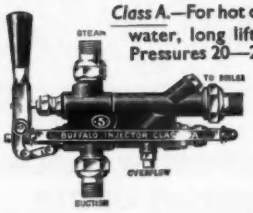
SMALL single truckloads and larger quantities of good ROUGH BREEZE from any gasworks, large or small, in the United Kingdom required by merchants paying own railway tolls. Cash price and particulars to No. 9378, *Gas Journal*, 11, Bolt Court, Fleet Street, London, E.C.4.

PLANT FOR SALE

FOR SALE :—ELBOWS, malleable iron screwed ½ in. gas parallel thread, large quantities available at cheap price. Apply: Purchasing Department, Parkinson Stove Co., Ltd., Stechford, Birmingham.

The
LIMIT OF EFFICIENCY CAN BE REACHED
by the use of
LUX
GAS PURIFYING MATERIAL
Sole Importers:
HARRISONS (London) LIMITED
66, Mark Lane, LONDON, E.C.3
Telegrams: Birchrock, London *Telephone:* ROYal 3120

BUFFALO INJECTOR
Class A.—For hot or cold water, long lifts, etc. Pressures 20—200lbs.



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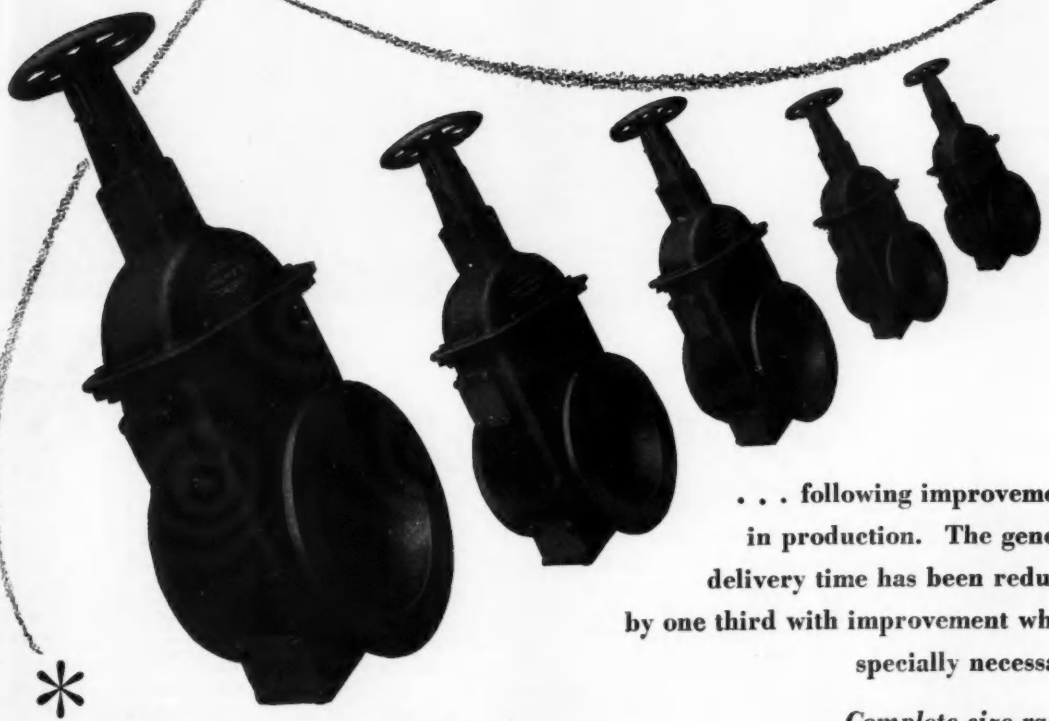
162a Dalston Lane, London, E.8

THE BRITISH GAS PURIFYING MATERIALS CO., LTD.
NATURAL BRITISH.
BOG (DUTCH and DANISH) ORE.
SPENT OXIDE.
LONDON ROAD, LEICESTER.
Telegrams: "BRIPURIMAT"
Telephone: 57086

SCRAP GAS METERS WANTED!
A SPEEDY SERVICE
Sell to those best suited to deal with them.
TOP PRICES PAID
Collection arranged from anywhere in U.K. *Truck Loads to our own private siding, Beddington Lane, Southern Region.*
Sell to **MITCHAM SMELTERS LTD**
ROMETAL WORKS, RED HOUSE ROAD, MITCHAM ROAD, CROYDON SURREY
TELEPHONE
THOrnton Heath 6101
PRIVATE BRANCH EXCHANGE

Delivery is better now

Delivery for Standard Vertical Type 24" bore now reduced to one month.



. . . following improvements in production. The general delivery time has been reduced by one third with improvement where specially necessary.

Complete size range available 3" to 48" bore

HOLMES 'WESTERN' VALVES

FOUNDED 1850 HOLMES HUDDERSFIELD

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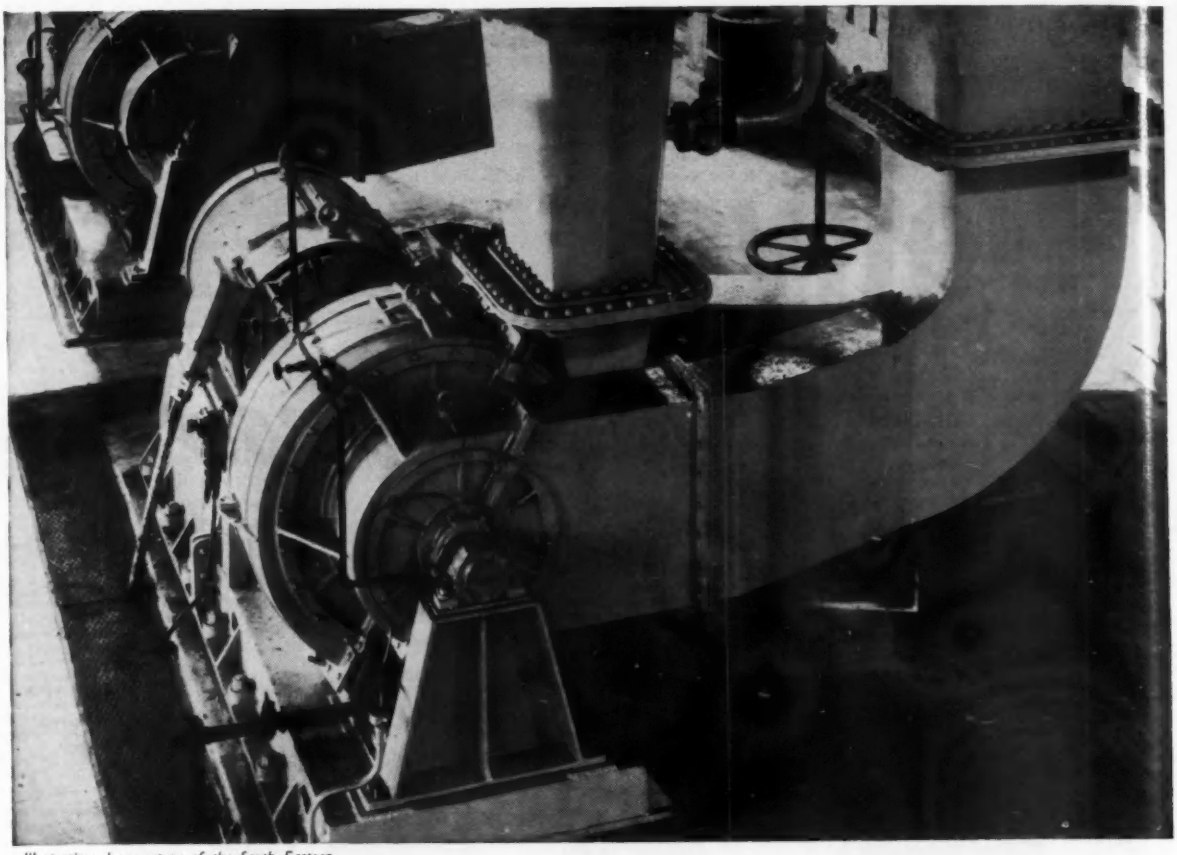
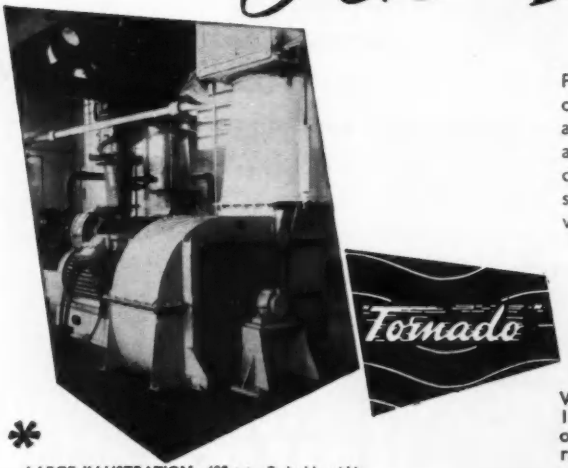


Illustrations by courtesy of the South Eastern Gas Board and Messrs. Humphreys & Glasgow Ltd.

Gas Boosting *



Part of an installation at the East Greenwich Gas Works for the supply of South London's gas are the "TORNADO" gas boosters illustrated above. Each is capable of shifting over a million cubic feet of producer gas an hour, and each was supplied with cast iron gas tight casings with detachable segments for easy servicing, stainless steel impeller and shaft, self aligning roller bearings and flexible couplings. One of the boosters was arranged for motor drive and the other for steam turbine.

*

LARGE ILLUSTRATION: *42" type 9 double width double inlet gas boosters.*

DUTY: 1,095,000 cu. ft. per hour producer gas at 104°F. saturated, giving 28" w.g. differential over inlet and outlet connections taking 138 H.P.

SMALL ILLUSTRATION: *40" type 15 air blowers.*

DUTY:	*Closed outlet*	*Delivery*
Air quantity	*nil*	*12830 c.f.m.*
Speed r.p.m.	*1480*	*1475*
Static pressure	*15.8" w.g.*	*13" w.g.*
Power absorbed	*13 B.H.P.*	*39 B.H.P.*

FAN ENGINEERING AND INDUSTRIAL GAS EQUIPMENT

We are manufacturing gas boosters which cover a range of from 5,000 to 1,500,000 cubic feet per hour, and if you are concerned with the movement of air or gas, ask us to send you Publication No. 5/7, a survey of the standard range of "TORNADO" high pressure blowing and exhausting fans.

Keith Blackman LIMITED

MILL MEAD ROAD, TOTTENHAM, LONDON, N.17

'Phone: Tottenham 4522 (twelve lines). 'Grams: "Keithblac, Norphone, London."

434

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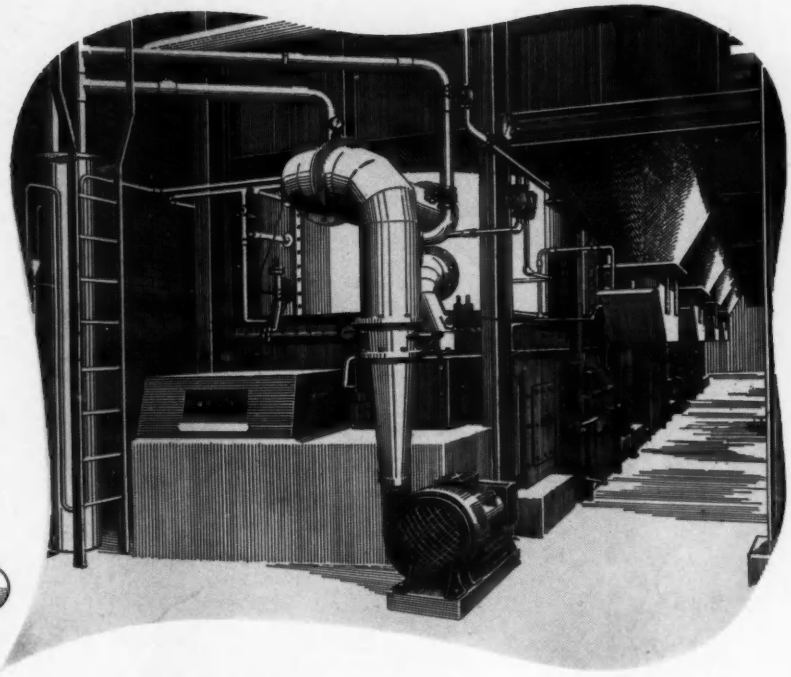
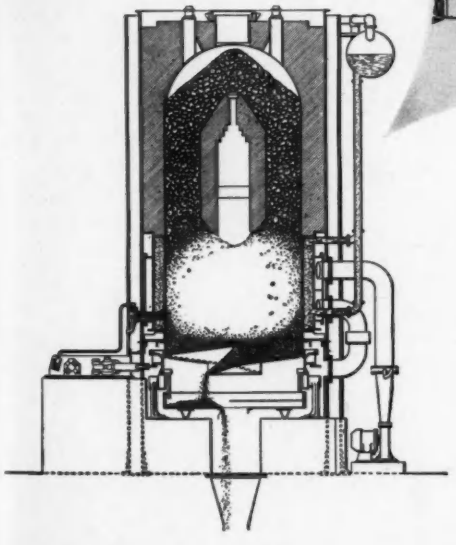
less labour, less fuel –
and the GAS STAYS HOT





West's "Hot Gas" Mechanical Producer

does more than eliminate manual clinkering. It has a hot gas efficiency of 90% and shows a marked reduction in the combustible content of the ashes. That, in turn, means fuel economy.

Producer and dust extractor are enclosed in a heavily insulated steel casing. The gas offtake, situated centrally immediately over the flare bed, draws off gas at formation temperature and is completely insulated, so that full advantage is taken of the sensible heat conveyed DIRECT to the settings. Dust extraction efficiency is up to 90%.

To maintain a constant depth of ash below the fuel bed, the speed of the revolving helical grate which removes the ash is automatically controlled by a novel device.

West's Gas
IMPROVEMENT CO. LTD.

ALBION IRONWORKS · MILES PLATTING · MANCHESTER 10

Telephone: COLlyhurst 2961. Telegrams: Stoker, Manchester.

London Office: Columbia House, Aldwych, W.C.2. Phone: HOLborn 4108-9 Grams: Wesgasco, Estrand.

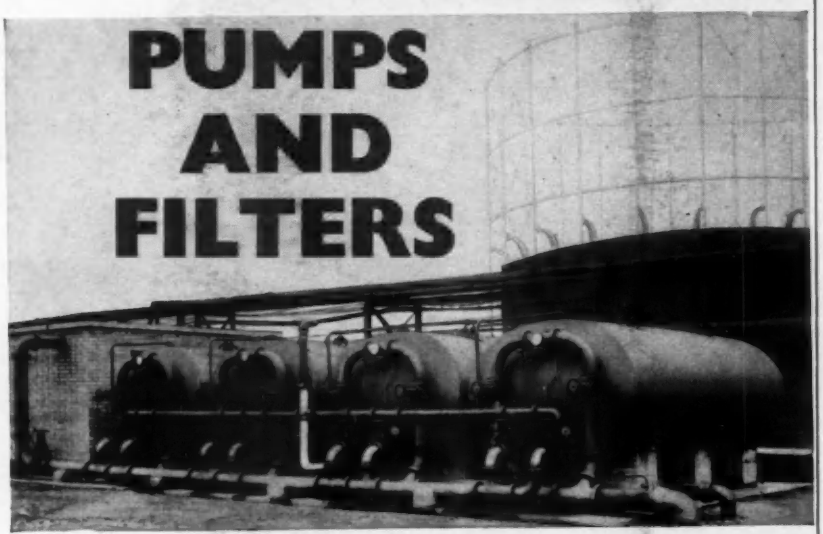
Pulsometer Engineering

IN ASSOCIATION WITH Joseph Evans

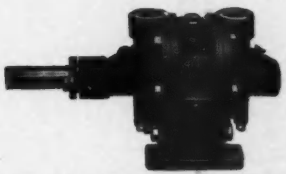
NINE ELMS IRONWORKS · READING

CULWELL WORKS · WOLVERHAMPTON

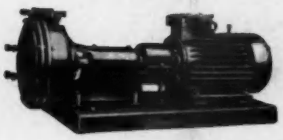
PUMPS AND FILTERS



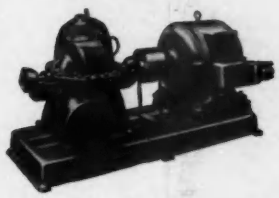
Filtration Plant in Gasworks



Rotary pump for Oil transfer duties

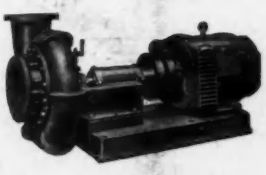


Stoneware pump for Corrosive and chemicals

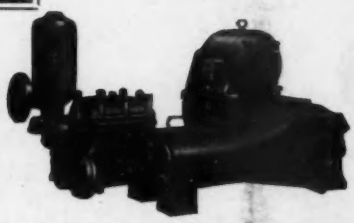


"HS" Type—for water services. All heads up to 500 feet.

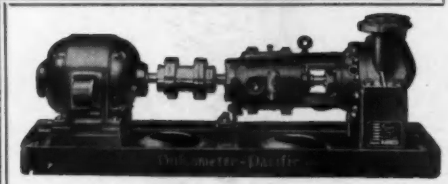
The illustrations show centrifugal pumps for light and heavy oil and liquor duties, stoneware and special metal pumps for handling acids and alkalis, pumps for circulating and washer duties, for clean water and fire services and for liquids containing abrasives.



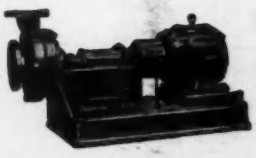
Slurry pump for coal washing and abrasive liquids.



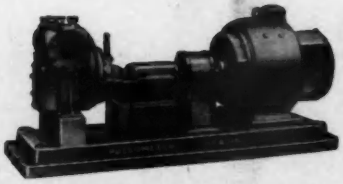
Reciprocating pump of modern design for Gas Works.



Pulsometer—Pacific type, based on latest American practice.



"JA" & "JB" types for high temperature water circulation.



Self priming centrifugal pumps.

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